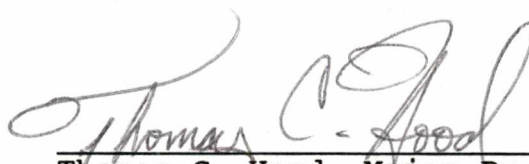


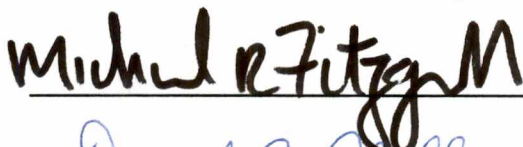
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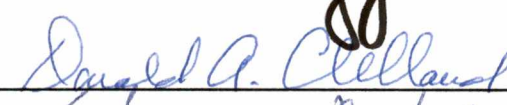
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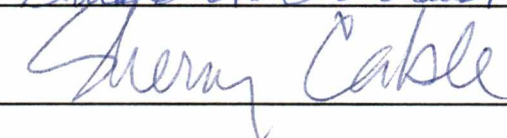


Thomas C. Hood, Major Professor

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Vice Provost
and Dean of The Graduate School

NATIONAL TELEVISION EVENING NEWS COVERAGE OF
OZONE DEPLETION AND THE GREENHOUSE EFFECT:
A CONSTRUCTIONIST ANALYSIS

A Dissertation
Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Paul L. Jacobson

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DEDICATED TO LACHELLE

ABSTRACT

Deterioration of the atmosphere from stratospheric ozone depletion and the greenhouse effect has become an international issue receiving a growing amount of media attention. Interpretations of the causes and consequences of the issue have been transformed over the years as have the responses by regulatory control agencies and international bodies. Differing interpretations of the implications and appropriate responses have characterized the issue since it was first "discovered."

This study examines how these two related environmental issues have been covered by national television evening news. The television news career of these two issues were analyzed in terms of constructionist theory. Two central concerns of constructionist theory as applied to the sociological area of social problems were explored: the progressive definition and development of the issue and major themes expressed by key actors or claims-makers appearing in the news. News coverage of the issue was examined by applying a four stage natural history model proposed by Spector and Kitsuse attempting to identify stages of development through which the issue progressed. Major themes expressed by five claims-makers (scientists, industry spokespersons, politicians, environmentalists, and citizens), were examined in terms of their development over

the years.

All national television evening news segments covering atmospheric deterioration from 1974 to 1989 were obtained from the Vanderbilt Television News Archive. Each newscast was transcribed and coded for analysis. A separate Word Perfect file was constructed including all references to and interviews with each claims-maker. Television news was used as a case study of the development of the issue.

General confirmation was found for the four stage natural history model of social issues. Variation from the model existed as issue development occurred not in distinct stages, but rather in the form of a thesis/antithesis process. Claims-makers entered, became relevant, and exited, at various times depending on developments of the issue.

The research agenda of constructionist theory, as it has developed in the area of social problems, offers theoretical coherency to the area of environmental sociology. Theoretical congruity is gained by focusing on the processes which characterize the development of environmental issues and the interaction among key claims-makers who collectively interpret issues within a social context. This theoretical orientation explains how environmental problems gain public recognition and social meaning.

TABLE OF CONTENTS

Chapter 1	INTRODUCTION.....	1
Chapter 2	THEORETICAL FRAMEWORK.....	7
	Introduction.....	7
	The Constructionist Approach.....	8
	Backdrop of the Constructionist Approach to Media Analysis.....	13
	Early Difficulties of the Media in Reporting the Environment.....	19
	Theoretical Aim of the Study.....	36
Chapter 3	METHODS.....	43
	Content Analysis Techniques and Focus of the Study.....	45
	Unit of Analysis.....	47
	Limits of the Problem.....	48
	Description of Data Sources.....	49
	Methods of Data Collection.....	50
Chapter 4	THE PROCESS AND NATURAL HISTORY OF THE ISSUE.....	54
	Introduction.....	54
	Pre-Stage: Conditions Existing Before the Emergence of the Issue.....	57
	Scientific Background of the Discovery of Ozone Depletion.....	63
	Stage 1: Emergence of the Problem in the Media.....	70
	Stage 2: Official Response to Claims, Recognition of Legitimacy, Involvement and Formation of Agencies, Official Investigation.....	75
	Conclusion.....	101
Chapter 5	THE CLAIMS-MAKERS.....	107
	Introduction.....	107
	Scientists and Television News of Atmospheric Deterioration.....	109
	Industry and Atmospheric Pollution on Television Evening News.....	130
	Portrayal of Politicians in Atmospheric Pollution News Segments.....	150
	Environmentalists in Atmospheric Deterioration News Segments.....	160

Ozone Depletion, Greenhouse Effect, and the Average Person.....	167
Conclusion.....	177
Chapter 6 CONCLUSION.....	181
REFERENCES.....	187
APPENDIX.....	200
VITAE.....	208

CHAPTER 1

INTRODUCTION

The sociological investigation of social problems incorporates a wide range of issues and conditions considered problematic. A traditional assumption of this area of study within sociology has been that the essence of social problems rests in objective undesirable social conditions. Since the mid-1970s, however, a theoretical development in the area has emphasized the subjective nature of social problems. Instead of looking to the myriad of objective conditions considered undesirable, this developing approach presumes that social problems are what people define them to be. This constructionist approach to social problems has provided a theoretically integrated tradition of writing and research in the area of social problems (Schneider, 1985).

Beginning in the late 1960s, environmental problems caught the attention of the general public. Concern for the environment has endured and an area of study focusing on the social relevance of the environment has developed within sociology. Since its emergence, environmental sociologists have attempted to delineate the essential characteristics that qualify this new specialization as a distinct area of inquiry (Dunlap and Catton, 1979). Later developments in environmental sociology have reflected characteristics of the

discipline as a whole, a trend towards fragmentation and a pursuit of middle-range theories (Buttel, 1987). As a whole, the area of environmental sociology lacks an integrated theoretical tradition.

This study analyzes the environmental issue of atmospheric deterioration, applying theoretical developments in the area of social problems. This inquiry is relevant to the area of environmental sociology, which lacks theoretical structure, because constructionist theory can be used to explain an environmental problem in a social context.

National television news coverage of two forms of atmospheric deterioration are analyzed: ozone depletion, appearing on nightly news since 1974, and the greenhouse effect, first appearing on national news in 1981. The focus is on two features of this environmental issue: how the issue has evolved over time and how themes have been developed by sources appearing on national news over the years. This longitudinal study analyzes the issue as an emergent sequence of events.

Unlike most social problems, the "discovery" of atmospheric deterioration, as well as its career, was completely covered in the age of television. Analysis of television news thus provides a case study of the emergence and development of the issue. A brief overview of the issue as portrayed by the news media can provide an orientation. Two chemists from the University of California, Molina and

Rowland, suggested in 1973 that ozone would be destroyed by catalysis of chlorine atoms and that a significant source of chlorine atoms is chlorofluorocarbons (Freon is the DuPont trade name).

During the next decade, much laboratory and field research strengthened this proposition and led to expanded media attention to the dangers of increased ultraviolet radiation on living organisms. Potential problems from increased exposure to ultraviolet radiation are increased skin cancers, especially malignant melanoma via damage to DNA. Other potential consequences are effects on terrestrial plants, marine organisms, and the food chain.

Decreases of stratospheric ozone in the springtime over Antarctica were first reported in 1975 by the British Antarctic Survey, and have since been intensifying. These findings led to a concerted international research effort. By 1987, it was decisively demonstrated that chlorofluorocarbon (CFC)-derived chlorine atoms were, and would continue to be, the major cause of ozone destruction. CFCs implicated in ozone reduction are also potent greenhouse gases, estimated to cause 15-20 percent of the expected warming: thus the rationale for considering global warming as part of the same issue. In addition, changes in atmospheric temperature may decrease the effect of CFCs on ozone. There is a greater amount of uncertainty regarding global warming because the effect of greenhouse variables is unknown.

Political implications of international controls of greenhouse gases, including CFCs, are global, because effective control can be achieved only if all the main producers and consumers are involved. Important strides have been accomplished with the Vienna convention in 1985 and the Montreal protocol in 1987. However, implementation of these agreements has not been effective. A central political dilemma is resolving the need to reduce production and creating alternative products while accommodating the enormous technical and economic costs involved.

This investigation of these developments of the issue ozone depletion/greenhouse effect is guided by the constructionist view of social problems, a theoretical perspective that has been forming since the mid 1970s. The principal proposition of this theory is that social problems are the definitional activities of people concerning conditions they regard troublesome (Spector and Kitsuse, 1977). In this view, social problems are socially constructed by the actions of problem participants making claims and by the process of such activities through time. The development of the issue on television news is reviewed in light of a four-stage natural history model of social problems formulated by Spector and Kitsuse (1977). Their natural history model attempts to account for the "emergence and maintenance of claims-making and responding activities" (Kitsuse and Spector, 1973:415). Application of their natural history model to the

development of atmospheric deterioration thus allows understanding of how this social problem and its related activities has come about and how the problem has evolved over the years.

The constructionist approach used in this study directs attention to the subjective nature of social problems. Our sense of what constitutes a social problem is shaped by the interpretations of the purported condition by those lodging claims. A problem does not become social until people notice the condition and define the condition as a social problem. These claim-makers define and direct our understanding of the nature of the problem (Best, 1989). Although there are certain objective effects of atmospheric deterioration, there is a subjective history of the problem. The problem had to be identified by collaborating scientists, its possible effects predicted, and its seriousness brought to the attention of the public.

Atmospheric deterioration has the unique quality of being an environmental issue that was not discovered until 1973. Most constructionist studies of social problems analyze the redefinition of a social problem, or the reemergence of public concern of a condition. Thus special attention in this study is directed to the emergence of the issue, as well as events occurring prior to and during the appearance of the issue on television news which influenced the initial framing of the issue.

Contributions to the social construction of this issue as it has unfolded on television news, come from the manner by which news workers, portrayed as well as the claim-makers appearing in the news portrayed the issue. This study will examine how television news has framed the issue and the claim-makers involved in the issue over the years. How have news workers simplified a complex environmental issue in order to make the problem understandable and entertaining for the viewing audience while confining coverage to a limited amount of time?

These developments during the television news career of atmospheric deterioration are given theoretical orientation in Chapter 2 by a review of the theoretical framework of the constructionist approach to social problems. Chapter 3 presents the methodology used in analyzing this issue: how the data were obtained and how they were converted and used in content analysis. Chapter 4 examines the process of the issue during the fifteen years of news coverage in terms of Spector and Kitsuse's four stage natural history model of social problems. Examination of major themes and strategies of key claims-makers is the topic of Chapter 5. The last chapter etches out some general conclusions drawn from the study.

CHAPTER 2

THEORETICAL FRAMEWORK

Introduction

The theoretical orientation of this study draws from constructionist theory that has developed since the early 1970s in the sociological area of social problems. From this perspective, social problems are socially constructed in terms of the actions of participants, i.e. claims makers, dealing with the purported problem over time. In the spirit of Berger and Luckman's work, The Social Construction of Reality (1966), attention is drawn to the manner by which people assign meaning to the world. The constructionist perspective advances a way of defining and studying social problems that departs from prior perspectives which focus on objective conditions considered social problems.

Those working within a constructionist perspective have etched out a distinctive approach to the study of social problems. However, constructionist research has come under criticism by constructionist analysts themselves, who point to internal inconsistencies or "ontological gerrymandering" (Woolgar and Pawluch, 1985). Others criticisms come from analysts outside of the perspective who embrace the traditional objectivist approach to social problems.

This study of national television evening news coverage

of the greenhouse effect and ozone layer destruction applies insights from constructionist theory in order to analyze claims-makers who have routinely appeared on newscasts. This longitudinal study also draws on the constructionist approach to analyze the claims-making process that has evolved during news coverage of these two related environmental issues. The first section of this chapter describes the development of the constructionist approach. The next section discusses the evolution of media analysis. First, early studies focusing on how media shapes images conveyed are examined, followed by the more recent constructionist studies that detail media's role in "constructing" social problems. The third section discusses media coverage of the environment: early difficulties in reporting on the environment and constructionist research of news covering the environment. The fourth section discusses the emergent nature of these two environmental issues and reviews a four-stage natural history model of social problems developed by Spector and Kitsuse (1973) that is applied to this study. The final section describes the theoretical intentions of this study of national evening news coverage of atmospheric deterioration.

The Constructionist Approach

Development of Constructionist Theory of Social Problems.

Blumer (1971) suggests that sociologists have erred in looking to objective conditions in identifying social problems, as

though such conditions have an intrinsic nature, independent of the social processes by which they are defined. He maintains that rather than discerning social problems only after they are recognized by society, sociologists should "study the process by which a society comes to recognize its social problems" (p.300). Sociologists have traditionally identified social problems based on public concern. A problem inherent in this misguided approach, says Blumer, is that some ostensibly deleterious conditions are not recognized by the public, and are thus ignored by sociologists.

The research agenda of a changed focus, Blumer suggests, should include the study of the "role of mass media in selecting social problems" (p.302). The attention of sociologists should be turned to the social definition of a social problem and how it is conceived. As issues gain social endorsement they move forward in their career. The media, according to Blumer, are important arenas of public discussion, giving legitimacy to an issue producing issue careers.

Malcolm Spector and John Kitsuse (1973, 1977; Kitsuse and Spector 1973) call for a similar change in theoretical orientation. They develop a constructionist approach to the study of social problems in their defining of the area of social problems within sociology. From their perspective, a social problem is not an objective condition. Conditions are simply the subject of claims. People's claims as to what

constitutes a social problem are a collective product, constructed through social activities. For example, ozone depletion became a social problem as scientists wrote their first papers outlining possible harm from chlorofluorocarbons to the atmosphere, as government agencies formed task forces, as press conferences were held, and as other actors became involved in the issue.

In an approach similar to Blumer's, Spector and Kitsuse critique the functionalist perspective (e.g. Merton and Nisbet, 1971) that focuses on dysfunctional conditions and "latent problems." The traditional functionalist perspective of social problems places the sociologists in the position of "specialized authority" whose moral discernment supersedes that of the people studied. More importantly, this traditional approach does not etch out a unique subject matter for the sociology of social problems.

Exponents of the traditional approach who define social problems in terms of public values, claim value neutrality. As Manis (1974) indicates, however, embracing definitions based on popular values, beliefs, and biases does not eliminate values, it only exchanges them for the "imagery of popular majorities." Reissman (1972) points out that sociologists have not been effective in identifying social problems. Instead, they react after a social problem has been identified. Emergent and critical social problems are sometimes not identified. The neglect of poverty and white

collar crime, in his opinion, has sometimes given way to attention to trivial or spurious topics.

Spector and Kitsuse maintain that social problems can best be conceived in terms of activities by which they are constructed or defined (Rains, 1975; Woolgar and Pawluch, 1983). The theoretical focus shifts to the process by which individuals of a society define a putative condition as a social problem (Schneider, 1985b). For example, if the discovery of harm to the atmosphere by chlorofluorocarbons had not been discovered, the instances of skin cancer, cataracts, and other consequences of increased exposure to ultraviolet rays still would have occurred. The construction of this particular social problem occurred not as a result of the actual deteriorated condition of the atmosphere, but arose as various groups responded by forming scientific arguments and presenting claims regarding the causes, consequences, and solutions of the purported problem.

Constructionist Research of Social Problems. A central concern of researchers applying a constructionist approach is the process of claims-making activities by people and groups concerning the alleged problem. Empirical research by constructionists typically identifies the key actors in the process, relates the claims to the interests of the actors, and describes the crucial stages in the problem's construction (Best, 1987). Many studies accent the specific claims that

are made, but most researchers focus on the people who make the claims and the process of claims-making rather than the actual claims.

There are other consistencies to the structure of social problem arguments using a constructionist approach. Woolgar and Pawlwich's (1985) review of constructionist studies reveals that each one points to a putative condition which is the topic being addressed by claims-making activities; proposes one or more claims regarding the condition; and identifies the definers. Each study also uses a format of explanation consisting of two parts.

First, the explanation begins by invoking certain sets of behaviors and conditions, and by presenting a picture of varying responses (definitions and claims) associated with them. Second, each study invokes characteristics of prevailing socio-historical circumstances to account for variations in definitions.

Constructionists studies place claims-making activities within a socio-historical context by examining social "forces" (Aronson, 1982; Markle and Troyer, 1979; Nuehring and Markle, 1978; Pfohl, 1977; Rose, 1977), or "social structure" (Ball and Lilly, 1982; Schneider, 1978). The explanation of each study rests upon the discordance between the conditions and the responses (definitions and claims). Such explanations feature the efficacy of agents. If it can be shown that conditions remain relatively the same while variation in

response occurs, then changes in responses can not be attributed to prevailing social contexts. Explanation pointing to the intervention of socio-historical circumstances can be effective only if actual conditions can be shown as remaining the same.

Backdrop of the Constructionist Approach to Media Analysis

Research shows that media decidedly shape impressions conveyed to the public. More than merely conveying messages, the media also structures reality by selecting, accenting, and interpreting events (Weiss, 1968). As issues are covered over time, media structures them and establish their meaning (Lang and Lang, 1969). Media also reflect cultural values and even cultivate images of society (Gerbner, 1972:158). Communication in general, according to Chaney (1977), helps to create and sustain a humanly constructed and meaningful reality.

The constructionist approach has its origins in works examining the political culture as it is based on language and social symbols and how this leads to the development of public discourse. As early as 1922, Walter Lippmann, in his book Public Opinion, pointed out that the real environment is too encompassing and complex for direct acquaintance, and thus there is a need to comprehend the world through the use of mental maps: thus simplified pictures are formed, messages compressed, and stereotypes employed. Mental images of events

which people do not directly experience have reference in symbols, an important part of public discourse.

McLuhan's (1964) work furthered the examination of the relation between media and the cultural system. He reviews the connection between media inventions and cultural change by focusing on the character of various media, contemporary revolution in communication, and how media shape history. He suggests that "the medium is the message" in that characteristics of the media themselves create radical modifications of sensibilities. In terms of television, an image-oriented medium, a feature that influences messages is the need for constant sensory stimulation.

Contemporary Constructionist Theory of Media Analysis.

Contemporary constructionist thought can be found in those works which analyze how mass media frame and reproduce the dominant political culture (Tuckman, 1978). Media are viewed as a cultural system that replicates society; they correspond to, record, and make representations of larger ideological structures. As stated by Gitlin (1979:7), "commercial culture does not manufacture ideology; it relays and reproduces and processes and packages and focuses ideology that is constantly arising---."

Claims-makers are careful when dealing with the media. News media are gatekeepers for those seeking to make noteworthy claims. News coverage of a claim helps validate it

as worthy of attention. There have been studies examining the struggles of claims-makers to get their claims reported during the anti-war (Gitlin, 1980), the environmental (Molotch and Lester, 1975; Schoenfeld, Meier, and Griffin, 1979), and women's movement (Tuckman, 1978). Claims that are prepared with the media's practices in mind tend to be covered most often. It is important that claims fit the media's criteria for, what Gans (1979) calls, "story suitability." Appropriate claims-making uses suitable rhetoric. Gusfield (1981), for example, points out that scientific evidence used to support claims is more than mere objective evidence. It is a type of rhetoric. The use of objective evidence allows claims-makers to present their information in a persuasive way and, therefore, reflects a "rhetoric of science."

The selection of events that are considered newsworthy by journalists is one criteria that Fishman (1978) found contributing to the construction of a crime wave in the media. His case study of a major "crime wave" against the elderly during 1976 in New York, revealed a growing and over-lapping media coverage. The theme of crime against the elderly was reiterated by several news reports, creating a media wave. Such crime news, Fishman maintains, is ideological because journalists rely on police accounts of crime, and news-work routines themselves produce stories that convey meaning. Journalists used criteria in recognizing good or newsworthy stories; these became routinized and filtered out crimes that

were not considered newsworthy.

Editors, reporters, and other news-workers in addition to reporting the news also "make news" (Glasgow University Media Group, 1980; Fishman, 1980). Images of issues are influenced by how news media define them. These images are developed by such factors as: who is selected to be interviewed or quoted; how news portrays what key actors in the news say; the rhetoric selected in making a point; and the transitions of these accounts over time. Gitlin (1980) points out that the modern concentration in ownership and greater reach of media gives media greater power in defining common language, life styles, and cultural symbols. His critical review of paradigms of "media sociology," such as Lazarsfeld's orientation to the study of mass media, argues against the traditional sociological stance of the relative unimportance of mass media.

In a study of the how the media covered the New Left and the antiwar movement of the 1960s, Gitlin (1980) shows how key ideas of claims-makers who challenge dominant institutions are shaped by the needs of media. Important ideas of spokespersons of the movement were dismissed or trivialized, but conflict and dramatic or bizarre incidents received much attention. Spokespersons for the movement were "created" by media. Reporters sought out individuals who were most outspoken. An image of objectivity and balance was created by pitting various opinions of the issue against each other.

These spokespersons selected by the media were made celebrities who then became unable to deal with the role accorded them and became less able and concerned with conveying movement claims.

Viewing news as a constructed reality, Molotch and Lester (1974) also point out that news content is the result of needs of news-workers as they are guided by practical purposes in assembling the news. Their research suggests that news assemblers such as editors, reporters, and anchors, transform occurrences into public events. The process of generating an event involves the selection of occurrences considered newsworthy and the assemblage of certain features of the occurrence. The content of news is also shaped by news assemblers in accordance with practical organizational needs, such as routine ways of doing work in newsrooms and profit needs of the news institution.

In his book Creating Reality: How T.V. News Distorts Events (1976), Altheide emphasizes how the organizational and practical features of newswork cultivates a perspective of events which in turn distorts them. While other critics concentrate on the discordance between the objective nature of an event and how it is reported, Altheide focuses on the production process of news and how it "imputes meaning and significance to people and events (p. 24)." Television news decontextualizes events, dislocates it from the circumstances in which it occurs. A fundamental distortion exists because

"---current news practices treat events as though they have objective qualities independent of the motives, purposes, and understandings of the people involved" (p. 24). Events are transported out of their customary circumstances and meanings and set in an alien situation, i.e. a news segment.

In addition to being influenced by practical features endemic to the news institution, the content of news is shaped by those holding power to promote news. Calavita (1983) found that the media played a role in discrediting the past work of OSHA. During this time the Reagan Administration dismantled the agency by replacing the head directors with anti-regulators. The agency and their claims were undermined as the new administration controlled the production of new claims through the use of media stories. Randall and Short (1983) find that OSHA and other bureaucracies serve as a news beat in that they provide information reporters can easily use. Routine use and dependence on such "official owners of problems" discourage interpretations of claims that are different than claims offered by such bureaucracies.

Herbert Gans (1979) also demonstrates that official sources are typically selected to make the news. The tendency of journalists to routinize their work allows them to make deadlines by depending on reliable sources. This journalistic need leads them to use "Knowns" such as the president, senators, government officials and corporate executives. Almost eight of every ten foreign and domestic stories in the

New York Times and the Washington Post, he finds, are told by public officials. The "Unknowns" such as the poor, black, or unemployed, make the news primarily when they threaten the "Knowns."

According to Mark Fishman, in his book Manufacturing the News (1980), news may be viewed as the outcome of two systems which manufacture accounts. First are the journalistic accounts which ultimately define and determine the series of accounts which constitute the news story. Another set of vital accounts underlying those of journalists are those of bureaucracies. The bureaucratic logic of news reporting aids in constructing news out of an amorphous world of occurrences.

Early Difficulties of the Media in Reporting the Environment

News coverage of the environment has evolved slowly over the years as a result of various features of the topic and media. One medium slow in acknowledging environmentalism until 1970 was the press (Sellers and Jones, 1973; Witt, 1974). In a review of how the press "constructed" the environment as a social problem, Schoenfeld, Meier and Griffin (1979), find that during the 1960s and 1970s the press did not possess a vocabulary that accommodated a holistic conception of environmental problems. They discover that by the late 1970s, reporting of environmental news only partially reflected a set of concepts that captured notions such as the interdependence of the earth, and long-term implications of

environmental degradation. Reporters during this time had difficulty grasping the substance of the issues and developing a "style" of reporting environmentalism.

Media coverage of environmental issues has been criticized for other reasons. Some have criticized the tendency of "Afghanistanism," the proclivity of media to cover distant problems while ignoring local ones (Rubin and Sachs, 1973). A related trend is what Hochberg (1980) refers to as "Chamber of Commerce boosterism," or the belief by some editors that the local community will lose from rigorous environmental coverage.

Another criticism is that media have overlooked major environmental stories. For example, the political events and eventual passing of the National Environmental Policy Act (NEPA) in 1969 was slighted by newspapers throughout the United States (Schoenfeld, Meier, and Griffin, 1979). Conversely, Broughton (1982) maintains that the extent of environmental degradation has been overstated by doomsayers who profit from exaggerations.

Others suggest that the lack of perspective by journalists reporting on the environment during this time was partially due to science writers' deficiencies in social science training. Few reporters covering the science beat had a basic understanding of social science theories and methods (Ryan and Dunwoody, 1975). During the late 1960s, some science writers avoided environmental issues, maintaining that

the political, social, and economic aspects of the stories made them something other than science. However, this led to the development of journalists specializing in the environment (Dunwoody, 1986).

In appraising news coverage of the environment during the 1980s, Brooks (1990) points out that reporting started to focus on incidents rather than issues. In journalism, however, there is still little time for in-depth coverage of the environment in a broad, coordinated way. There is also a call for reporters to see why a claim is being proffered. Brooks quotes Tom Siegfried, science editor of the Dallas Morning News:

An environmental reporter is not doing the reader a service by reporting that side A says this and side B says this... He needs to go beyond just presenting the claim and counterclaim and look at the evidence behind those claims.

Howenstine's (1983) study of trends in environmental reporting from 1970 to 1982 also found evidence of, "An increased complexity of coverage in some of the nation's leading periodicals, and a general inclusion of more economic/developmental coverage---."

Media, the Environment, and the Constructionist Approach.

Elements of a constructionist approach can be detected in some empirical studies of media coverage of environmental issues.

The focus of some studies has been the proclivity of news media to use official sources as key claims-makers in defining environmental incidents as public events and social issues. Other studies have examined problems related to the exchange of information among claims-makers during environmental crises. Also examined are difficulties that arise when various sources attempt to define environmental incidents with dissimilar rhetoric.

Schoenfeld and his associates (1979) traces the early stages during the process of the development of the environment as a social problem. They find that during the early stages environmental claims went through a transition before they appeared regularly in the press. Claims-making started first with interest-group entrepreneurship, using independent publication, then moved to the government, and finally became part of the agenda of the press. News coverage of the environment also underwent a transformation. At first the press used categories of terms heldover from "conservation rhetoric" such as pollution, reclamation, and wildlife. Later, the style of environmentalism incorporated more inclusive concepts such as resources-technology system, and trade-offs among energy, economy and environment.

In reviewing media coverage of the Santa Barbara oil spill, Molotch and Lester (1975) use a constructionist approach as they question the assumption that there is an objectively significant set of happenings "out there" which

can be known to be important. The authors assume that what is actually reported by media depends on what news workers attend to. They find that federal officials and business spokesmen have greater success in gaining accesses to media and thus have "greater success in turning available occurrences into public events" than do conservationists and local officials (p. 253). The routine use of these sources for news survives as the tendency becomes ingrained as "professional norms" or "good journalism" of news practitioners.

The same tendency to define events according to the claims of official sources of news also holds true for reports on natural disasters. According to Quarantelli (1971) most news reports on natural disasters reflect an uncritical "command post point of view."

The reliance on official sources of news also characterized coverage of Three Mile Island and Chernobyl accidents, but Rubin (1987) found that reporters experienced difficulty in translating certain kinds of information by official claims-makers. Officials in charge of the accident attempted to cloak developments in a positive manner and were hesitant to substantiate bad news. During nuclear accidents, journalists tend to "impute the worst motives to official sources" when reliable and prompt information is not released.

But, even when information was available during the Three Mile Island accident, those involved in the crisis, such as reporters, technicians, industry representatives, and

government spokesmen, searched ineptly for language capable of defining, explaining, and assimilating the event. In studying the root metaphors used during the incident, Farrell and Goodnight (1981) found that the "crisis was generated and sustained by the failure of technical reasoning to inform adequately public deliberation." The discourse used constituted a crisis. Technical statements could not be judged by reporters. Government sources sometimes stood in opposition with one another. Misleading statements were made by industry spokesmen. A rhetorical crisis rendered claim-makers inept in defining the situation or in interpreting the claims of others.

Sood and his associates (1987) study of five separate natural disasters reveals that the process of defining an event as a disaster involves the "interaction of many key actors in news coverage." Although media assign a value to and define a disaster dependent on the number of deaths involved, other criteria are relevant such as who the victims are and where they are from.

Rogers and Dearing (1988) found that the Ethiopian drought was defined as a disaster only after scenes of the area were shown on BBC and then NBC in 1984. Although the drought and its consequences had taken effect years earlier, the event was not placed high on the media agenda, and subsequently on the public agenda, until vivid scenes of the victims were shown.

Dramatic events also are placed high on the media agenda. Stallings (1990) finds increased media coverage of the issue of bridge deterioration in United States following a dramatic bridge collapse. Although the time period of increased news coverage of the general issue of bridge conditions subsided shortly, there was a change in the claims-makers who appeared in news. As others have found (Hilgartner and Bosk, 1988; Gans, 1979), Stallings found that victims and eyewitnesses satisfied media's need for novelty during the early period of news coverage, but members of commissions and investigative bodies were used later to avoid media saturation of a single event.

Packaging the News: Constructionist Addendum.

Contemporary constructionist theory analyzing media examines media discourse and how it creates a set of interpretive packages that condense and give meaning to issues (Gamson, 1988). Reporters, editors, and managers of television news, rely on packages in shaping the messages of broadcast news, to summarize world events and social issues, and to create a kaleidoscope of images to retain the viewing audience.

There is an internal structure to packages which Gamson (1988) conceptually divides into two parts: frames and reasoning devices. Framing devices integrate and synthesize, in a gestalt manner, the core idea of a package. A frame captures the essence of what an issue is about. It deals with

the main concern and the central source of controversy. Bennett (1975) uses a similar concept, political scenario, which, he suggests, is often expressed through compelling examples that organize data. Gitlin (1980, p.7) points out that media frames, "largely unspoken and unacknowledged, organize the world both for journalists who report it and, in some important degree, for us who rely on their reports."

The other part of a package provides reasoning and justifications for positions on issues. Devices of reasoning make distinctions, state causes, and point to arguments used in making a position on an issue sound reasonable. While a frame creates coherence and offers a systematic whole in conceptualizing an issue, justifications are based on lines of reasoning that analytically distinguish among various grounds of argument regarding a position on an issue.

A package is usually presented in abbreviated form during news broadcasts. Framing decisions are based on time restraints and a need for a constant flow of fragmented and discontinuous messages that captivate the audience. Both the core frame and the justification for a position can be reduced to a shorter form through the use of condensing symbols.

A set of condensations which suggest the core frame and the reasoning of a position is presented by Gamson and Lasch (1983). They divide these shorthand devices into framing and reasoning devices. The devices that indirectly convey frames by which issues are addressed include metaphors, exemplars,

catch phrases, depictions, and visual images. Those devices which evoke justification for a position on an issue are roots, consequences and appeals to principle.

These various condensing symbols which reflect the core frame and positions in abbreviated form allow packages to be expressed as a whole; they give meaning to issues, and they connect package frames to more comprehensive world views, themes which are more inclusive than particular issues. Pervasive American themes such as technological progress, responsible capitalism, and individualism (Gans, 1979) have cultural roots which, if captured by certain packages, tend to be internalized more thoroughly by the media and members of the culture. Such cultural resonances create natural advantages for certain packages on specific issues by making them more appealing and familiar (Gamson and Modigliani, 1989).

Packages also have careers; they come into prominence both in the media and in terms of salience with their respective publics. In some instances the issues expressed by packages become resolved or become non-issues. How each issue is packaged and how issues are given meaning through the use of framing and reasoning devices changes over time. The production of package careers follows a process which is influenced by how they resonate with larger cultural themes that prevail throughout society.

The Emergent Nature of the Issue. The meaning of the two interrelated environmental issues of ozone depletion and the greenhouse effect has been constructed and revised through coverage by television evening news. As scientists researched and discovered new findings, as politicians and governmental agencies made policy recommendations, and as industrial spokespersons reacted to scientific claims and political recommendations, the meaning of the issues evolved. Various actors in the spheres of business, politics, government, and science, engaged in an ongoing construction of this definition. The collective activity of these key actors served to explain and interpret the meaning of atmospheric deterioration as it developed over the years.

During the past fifteen years of news coverage, several competing claims developed, each expaining what was occurring and what appropriate actions were needed to deal with the situation. This process involved scientists presenting their findings while pointing to possible scenarios of the future. Governmental agencies following suit, indicating the type of action called for. At times, industrialists disclaimed future projections and policy recommendations, to the point of condemning the science on which they are were based. This process and construction of meaning of these two environmental problems continues today.

Various definitions of social conditions are based on justifications for each version of reality and the suggested

lines of action deemed appropriate. An examination of how each claims-maker is portrayed by television evening news suggests that each version of the issue is based on an underlying ideology. The ideology of each group of actors provides a frame of reference which guides the reasoning and biases of each group of claims makers in relation to the situation. For example, underlying many arguments by industrialists, as portrayed by television coverage, is the ideology of deregulation, the right to produce profits, and a skepticism of the claims of science. Scientists and environmentalists, on the other hand, base many of their interpretations of the issue on the assumption that nature is fragile and its protection is essential for the continuation of life. Other claims-makers, such as governmental agencies, express the need to protect public welfare, yet project a concern for the interests of industries. Television coverage of atmospheric deterioration is a portrayal of the assumptions and actions of these various actors and intensely shows how each claims-maker focuses on some features of the situation and ignores others.

These interpretations of the issue, existing in the form of claims-making, emerge and transform over time. Kitsuse and Spector (1973:415) point out that claims-making involves "demanding services, filling out forms, lodging complaints, filing lawsuits, calling press conferences, writing letters of protest, passing resolutions, publishing exposes, placing ads

in newspapers, supporting or opposing some governmental practice or policy---." The study of social problems involves the analysis of claims-maker's activities, how they come about, and how these activities change over time.

Spector and Kitsuse (1973) adopt and extend a four-stage natural history model that was previously outlined by Fuller and Myers, Blumer and others. The first stage is characterized by the idea or perception held by a group that some condition is unacceptable. These initial social problems activities include attempts to transform private troubles into public issues. Important concerns of analyses for social scientists entail the variety and type of claims, strategies to support these claims while gaining social recognition and backing, and the subsequent formation of public controversy.

Stage two occurs as governmental agencies and official institutions recognize and react to these claims (Spector and Kitsuse, 1973:154). Organizations are formed whose responsibility is dealing with the condition. This stage involves the routinization of the social problem in the form of action by influential institutions.

Once the social problem becomes legitimized and policy is implemented another stage may occur. During this period of legitimation, the official response may produce another set of definitional activities. Stage three transpires if participants maintain that official responses are problematic. Spector and Kitsuse point out that past natural history models

end with legitimation and implementation, but their model is open-ended, viewing official response as a context for further definitional activities.

The forth stage begins as claims-makers attempt to create alternative institutions to circumvent established procedures. This last stage comes about when claims-makers believe it impossible to work within the official or legitimate system.

Analytic Boundaries of the Constructionist Approach.

The relatively new constructionist approach to studying social problems has emerged from dissatisfaction with the traditional objectivist position. According to most social scientists embracing this new approach, the objectivist stance disregards the subjective process of defining social conditions as a social problem. Theoretically, the traditional approach has not etched out a distinct subject matter of study, has not served as a foundation for more general theories of social problems, and has not provided a constructive course for research.

The new approach remains controversial, however, and has received criticism in several forms. Some traditionalists remain steadfast, embracing objectivism while criticizing constructionist thought. Some point to implicit and contradictory theoretical assumptions or maintain that the approach is inherently inconsistent. Others who embrace a constructionist approach disagree about what types of inquiry

should be considered "constructionist."

The possibility of minimizing the difference between the constructionist and objectivist approaches seems remote given the distinct research agenda that constructionists have marked out. Constructionists' questions concerning the nature of claims (types of rhetoric, meanings, and interpretations), the interests of those making claims, and the trends in claims-making, are all based on a set of assumptions and research concerns different from those of objectivists. Objectivists are concerned with measuring the gravity of the social problem, outlining means of measuring the problems, and tracing the cause of the identified social problem.

A pivotal consideration which separates constructionists from objectivists, and constructionists from each other, is the centrality of "objective" conditions in the analysis. Objectivists place measurable conditions at center stage in their analysis. Strict constructionists (Spector and Kitsuse, 1975; Aronson, 1984) maintain that conditions are irrelevant to analysis of claims making. Attention is focused on claims-making with no attempt to appraise the accuracy of those claims. This phenomenological perspective assumes that all knowledge is socially constructed, including claims and analyses by researchers of those claims.

Other constructionists focus on the nature of objective conditions and attempt to determine the extent to which relevant claims accurately reflect those conditions. Best

(1989) suggests these analysts consider constructionism as a synonym for debunking. This constructionist approach distinguishes between conditions and claims about those conditions. Analysts using this approach assume knowledge of the objective conditions and focus on inaccurate or misinterpreted claims which they consider as "socially constructed" (Gusfield, 1984).

Between these extremes of phenomenological and debunking forms of constructionism is a form of constructionism which typifies most of its adherents, what Best (1989) refers to as contextual constructionists. The claims-making process remains the focus of their research interest, but analysts of this form of constructionism are willing to make some assumptions about objective social conditions. Understanding existing social conditions during claims-making gives insight into why particular claims emerge when they do, change over time, receive attention, or shape social policy.

Criticism of Constructionism. One of the most telling criticisms against constructionism, contextual constructionism in particular, is lodged by Woolgar and Pawluch (1985). Their criticism points to concealed, objectivist assumptions on which much constructionist work is based and which renders much of their analysis internally inconsistent. They point out that the focus of social problems explanations of constructionists are claims, yet the analyses normally assume

a knowledge of objective social conditions.

The typical constructionists' argument points to an unchanging social condition and follows the claims by people that define the condition as an emerging or worsening social problem. The discordance between the objective condition and the claims made regarding that condition are then demonstrated. Although constructionists imply that the social condition is irrelevant to their analysis, they assume that they know the status of the condition (usually through documentation indicating an unchanged status of the condition). This tension in some constructionist perspectives is called "ontological gerrymandering" by Woolgar and Pawluch. The confusion related to this selective attention to objective conditions, they suggest, is a product of the perspective's requirements.

In presenting their critique of "ontological gerrymandering," Woolgar and Pawluch make reference to several studies. For example, they charge Spector and Kitsuse (1975) of considering the "nature of marijuana" as a constant, independent of how it is socially defined.

Similarly, Pfohl (1977) is accused of "selective relativism" because he refers to "documentary evidence" about child beating before it was "discovered" as a social problem. In a retort to this charge, Pfohl (1985) defines his constructionist position as radically reflexive, a version of the social deconstructionism. Pfohl maintains that he does

not assume the objective truth of "documentary evidence" of the "discovery" of child abuse any more than he assumes that abuse existed before it was discovered. Pfohl maintains that documentary evidence, just as social definitions, "are nothing but the cultural, political and material effects of a human struggle for the organization of power in (and as) history." For Pfohl, what is taken as "objective" is also considered socially constructed.

Schneider (1985a) also responds to Woolgar and Pawluch's critique. He takes issue with their interpretation of the research ostensibly guided by the constructionist approach. Schneider views problems with some constructionist studies as "researcher carelessness and confusion" rather than "logical outcomes of an internally compromised view" (p.233). In yet another rejoinder to Woolgar and Pawluch's critique, Hazelrigg (1985) points out that research using the constructionist approach may have "lapses into realism (objectivism)," but it is also true that "lapses into definitionalism are the inconsistency of objectivism."

Another point of criticism of the constructionist approach is the lack of clarity by which viable claims can be identified. Spector and Kitsuse emphasize that judging social problems development depends on the identification of which claims and definitions are viable. Viable claims are those which continue to exist, that receive media attention, or ones that claimants can "get away with." Schneider and his

associates (1985) suggest that the concept "viability" should be clarified. This is important in understanding "precisely how participants' activities affect the viability of claims and definitions" (p. 225).

Finally, the heuristic concept of natural history may lead to premature generalization and prediction. Peyrot (1984) suggests the tactic of examining case studies from similar settings. How news is involved in the construction of social problems may entail a different sequence of events or processes than might a particular social movement. Also, using the concept of natural history may lead to an ad hoc form of analysis. Rather than finding certain kinds of activities occurring only at certain times or stages of the definitional process, Wiener (1981) finds evidence of an "overlapping," simultaneous, "continuously ricocheting interaction" (p. 7).

Theoretical Aim of the Study

This study analyzed fifteen years of national television evening news coverage of two related environmental issues, the greenhouse effect and ozone depletion. Guided by a constructionist approach, this study provides insight into the emergence and development of claims-making, as portrayed by television news, by variety of sources. Unlike most studies of television evening news, limited to information obtained from the Vanderbilt Television News Archives, this analysis

focused on actual video tapes in order to analyze specific rhetoric of claims by the most commonly appearing sources.

Much of the investigation dealt with television news' depiction of claims-making activities such as reports of press conferences by regulatory agencies, assessments and predictions by scientists, denials by industry, criticisms by environmentalists and politicians, and comments by citizens. Two key components comprised the analysis: the claims-making process characterizing the television news career of the issue and general themes reflected by individual claims-makers over the years.

The Claims-Making Process. As of this writing, the television career of ozone depletion spans fifteen years, and the greenhouse effect, eight years. During this time period each claims-maker has adapted his/her claims to developments with the issue. Specific forms of claims-making activities were therefore analyzed as they occurred within an overall process, guided by unfolding strategies and themes associated with each claims-maker. The identification of major themes and strategies of each claims-maker, and how they evolved, gave insight to the claims-making process.

Claims generate responses. Claims-makers engaged in conflict during this process. Typically, claims-makers in opposition made references to and criticized their adversaries. At what points in the career of the issue does

conflict occur? Which claims-makers are involved in conflict throughout the years, and who are their adversaries?

The claims-making process that has characterized the television news career of atmospheric deterioration is further analyzed in this study by relating the process to the four-stage natural history model developed by Spector and Kitsuse. Unlike most constructionists studies examining social problems that are "rediscovered" by some claims-makers, this research analyzes two environmental issues which had not previously existed as social problems before their discovery by scientists. To what extent do the two related issues conform to the model? Are there differences in the claims-making process between these two environmental issues? What changes occurred in the amount of news coverage over the years? What changes have occurred in how claims-makers depict the nature of the problems over the years?

Claims Makers. One focus of constructionist analysis has typically been the claims-maker. Constructionist studies normally describe the claims being made, but most analysts concentrate on the people who make claims and the process of claims-making rather than the claims themselves (Best, 1987). Most claims-makers were affiliated with a group which had a particular interest in the issue. Claims-makers characterize the issue of atmospheric deterioration in particular ways, emphasize some aspects of the issue and not others, promote

specific conceptions of the issue, and support implementation of certain policies.

This study thus involved analysis of how claims makers typify the problem. Best (1989) points out that "typification occurs when claims-makers characterize a problem's nature." In addition to identifying the problem, claims-makers suggest a particular perspective, which they assert, provides an orientation which allows the problem to be understood. Embedded within the various orientations are the ideologies held by each claims-maker. With whom is each claims-maker affiliated? How are their interests reflected in the causes they point to, the consequences they project, and the solutions they recommend? How are the claims shaped by particular source making the claim?

A fundamental form of claims-making is the definition of the problem and identification of the cause. The issue of ozone layer destruction was a previously unacknowledged problem before 1973. A few obscure works had suggested the possibility of a greenhouse effect, but this issue was essentially a new social problem when it first appeared on television news in 1981. In an instance such as this, the causes of the problem must be identified and their domain set. Scientists who first announced the discovery of possible harm to the atmosphere were what Pfohl (1977) refers to as a "discovery movement," claims-makers who announce the discovery of a new problem. Other sources in the news served to add to

the definitional process of the "new" and ambiguous problem. The definitional process was controversial and has continued during the television career of the issue.

Another basic form of claims-making is reference to consequences. Assessing the magnitude of the consequences was particularly controversial in the ozone depletion/greenhouse effect issues because estimations were dependent on scientific model projections of the future. A typical means of establishing consequences of a social problem is to estimate the number of cases, incidents, or people affected. However, controversy still persists today about the few immediate and tangible consequences that some claims-makers have attached to atmospheric deterioration. The heat wave of 1988 and increased instances of skin cancer and cataracts, for example, were suggested to be consequences of the greenhouse effect and ozone depletion respectively, but other claims-makers have appeared on television news differing with the identification of these consequences.

Finally, claims-makers differ in terms of the solutions they advocate. Agencies such as the Federal Drug Administration and Environmental Protection Agency offered solutions in the form of policies, but other claims-makers routinely took exception to policy recommendations. Claims-making by environmentalists, politicians, citizens, and scientists were examined in terms of the solutions they offered over the years.

The analysis of claim-makers revealed their first appearance on television news, and the frequency of their appearances throughout the years. Claims-makers defined the issue by their rhetoric, but network editors and journalists also used various claims-makers to interpret developments in the issue. The most common appearance by claims-makers consisted of a two or three-sentence taped interview cut and pasted together with other interviews. Thus newswriters had control over how they portrayed claims-makers as well as how they defined the issue.

Certain features of the two related environmental issues studied have bearing on the applicability of a constructionist approach. Unlike most other social problems, ozone depletion and the greenhouse effect do not possess objective status in terms of how they are experienced by most people. The issues of greenhouse effect and ozone depletion have indefinite effects, causes, and solutions. They are insidious, slow developing, invisible, and have implications for the future more than the present. Until the discovery of the ozone hole over the North and South Pole, there was no objective evidence which one could point to as proof of the "theory" of ozone depletion. Except for the recent detection of a slight global increase in temperature, the greenhouse effect similarly has not been convincingly substantiated with empirical evidence.

Claims-making, as represented by the appearance of various claims-makers on television evening news, thus

represents a form of social definition of an issue which lacks a distinct objective referent.

CHAPTER 3

METHODS

This study investigated television evening news coverage of the deterioration of the atmosphere by the three major national networks from 1974-1989. The analysis consisted of two parts. First, a content analysis of the Vanderbilt Abstracts investigated specific characteristics of news coverage of atmospheric deterioration (including the issues of aerosol spray can use, ozone depletion, and the greenhouse effect), by NBC, ABC, and CBS. Secondly, examination of 108 video tape segments of atmospheric deterioration focused on general trends of the progressive definition of the issue. The construction of the issue was also analyzed by revealing major themes expressed by key actors (claims-makers) over the years. This content analysis of news coverage consisted of quantitative and qualitative analyses. The bulk of the quantitative analysis was based on condensations of news segments of the three national networks found in the Vanderbilt News Index and Abstracts. The quantitative data were used only to augment the qualitative analysis. Categories were constructed in order to locate specific claims-makers and specific type of statements by those interviewed and referred to in the news. The categorization scheme reduced the data and made it more accessible for

analysis.

The frequency, length, and priority of coverage over the seventeen year time period were obtained from the index. The frequency of atmospheric deterioration news segments ranged from a high of 25 in 1989 to no coverage in 1980 and 1982. News segments ranged in length from 10 seconds to 310 seconds. There were 22 news segments that were 20 seconds long, 12 were 30 seconds long, and 9 were 120 seconds. In terms of priority of the news segment only 3 segments were the lead story of the newscast, 2 were second, 4 were the last segment, and 99 were placed somewhere else in the newscasts.

Trends in the type and frequency of claims-makers interviewed and cited were traced. Each claims-maker was categorized according to whether he/she was interviewed or referred to by the anchorperson or reporter. In 51 of the 108 news segments no person was interviewed (47.2%), 20 news segments (18.5%) included 2 interviews, and 16 news segments (14.8%) involved 1 interview. There were 4 (3.7%) news segments that contained 6 or more interviews. This category made it possible to locate interviews with particular claims-makers and determined who else was interviewed in the same news segment.

Qualitative analysis based on a review of past newscasts revealed trends in how television news portrayed claims-makers and the claims they made. There were five groups of claims-makers that were examined in depth in this study: scientists,

industrialists, environmentalists, citizens, and politicians. Primary concerns were their first appearance, the frequency of their appearance over the years, and trends in claims they developed (themes, strategies, or, in some instances, conflicts with other claims-makers).

The general issue of atmospheric deterioration was composed of the sub-issues: 1) spray can danger (11 news segments or 10.2% of all news segments); 2) ozone depletion (65 segments or 60.2%); 3) greenhouse effect (27 segments or 25%); and 4) ozone depletion and greenhouse effect (5 segments or 4.7%). Identification of these sub-issues allowed for the location of news segments and aided the analysis of trends and stages of issue development over the years.

Content Analysis Techniques and Focus of the Study

The technique of content analysis is the most common procedure used in communication analysis. As two of the more prominent texts of the method point out (Holsti, 1969; Krippendorff, 1980), content analysis can be used for a variety of media and offers the researcher a wide range of strategies of inquiry. Content analysis of evening network television news has rapidly developed since the 1970s, producing diverse forms of analysis (Adams and Schreibman, 1978). The scope of possible approaches used in content analysis of network newscasts ranges from "hard" to "soft" methods (Frank, 1973). The "hard" approach analyzes distinct

or quantifiable items of data, such as length of news segment, incidents of conflict, and number of interviews. The "soft" approach examines subjective elements including portrayal of claims-makers, their use of metaphors and other imagery. This research was based on both hard and soft approaches to content analysis.

There are three basic subjects that comprise distinct areas of study typifying content analysis of television network news: production, content, and effects research. Production research analyzes the processes that shape and produce news, and therefore focuses on understanding how news is selected and compiled. Content research focuses on how news is depicted. Important considerations of this area of television news research are patterns, depth, and themes in news. Effects research assesses the implications of the content for the listening audience, and the impact of news on citizens' orientations regarding politics and social issues.

This study focused on the content of newscasts. Primary concern rested on the priority of coverage and the nature of that coverage. Other studies concerned primarily with content of national network news of domestic issues include coverage of the student movement (Pride and Richards, 1974), critique of stories covering nuclear power (Efron, 1976), and coverage of race relations (Pride and Clarke, 1973; Roberts, 1975).

Other studies of national network news have investigated changes over time. Greenberg et al. (1989) analyzed all

environmental risk coverage in 26 months from 1984 through 1986. Bailey (1976) analyzed trends in news coverage of the Vietnam war from 1965 through 1970. Changes in campaign coverage in 1968 and then in 1972 were compared by Graber (1976). Longitudinal studies usually contrast two distinct time periods or focus on a brief period of time following an event. This study offers the advantage of investigating all news segments of an issue, from its original appearance on national evening news in 1974 through 1989.

Unit of Analysis

The unit of analysis was the total news segment. A typical news segment on atmospheric deterioration consisted of an introduction by the anchor with an over-the-shoulder still photograph, followed by a series of filmed and packaged presentations by one or more reporters. Scenes of nature, smog, industrial pollution, animations, graphs and other visual composed each news segment. In addition, most news segments included interviews (57 news segments or 52.8% of all news segments) and references to other sources (100 news segments or 96.6%). The identity of the interviewee and those referred to were categorized so that their statements and statements about them could be located during analysis.

The examination of key claims-makers in atmospheric deterioration news segments should include analysis of the total news segment. The analysis of key claims-makers of the

news segment focused on the specific news clip of the actor, yet included other parts of the news segment. The units used in content analysis of television news vary from specific wording to entire programs. Most studies, however, use the news segment as the analytical unit.

In order to gain understanding of the total news segment, and to provide a context for the statements of claims-makers being analyzed, previous statements by some of the other actors (anchors, reporters, and commentators) in the news segment were reviewed. The bulk of analysis involved a review of the complete news segment in addition to specific comments of interviewees and how their statements reflected developments in themes developed over time.

Limits of the Problem

Of the numerous media that cover environmental issues, this study was limited to national evening news of the three major networks. The data for the content analysis were obtained from two sources. Most of the quantitative analysis was based on data found in the Vanderbilt News Index and Abstracts. Qualitative analysis was based on the Vanderbilt University Television News Archives, (Vanderbilt University, Nashville, Tennessee), a videotape collection of evening news of ABC, CBS, and NBC since 1970.

Description of Data Sources

The bulk of the descriptive statistics of broadcast news of the three national networks came from the analysis of the Vanderbilt University Television News Archive. All television evening news programs of the three major networks exist in abbreviated form in the Television News Index and Abstracts, published monthly. An annual index is provided in bound form for all months of each year. The abstracts began in 1972 but the period of 1968 to 1971 are available "in various degrees of detail." The abstracts are condensations of newscasts, not verbatim transcripts. Thus the actual video tapes must be used for evidence of exactly what was stated on the news program.

By examining the abstracts and the symbols used in them, it is possible to determine: material originating in the studio, the place of the on-site report and the name of the interviewer, interviews conducted with others, the geographical location of the report, the length of the news segment, the position of the news segment in the total broadcast (top story or other), the date of the broadcast, sources cited (federal government, environmental advocate etc.), and instances when more than one source type occurs during a single segment. All segments in the abstracts dealing with atmospheric deterioration were used in the analysis of trends over the seventeen year period studied.

The actual video tapes were used for the analysis of

claims-makers appearing in the news. After determining relevant segments from the abstracts, the researcher ordered the segments from the Vanderbilt News Archive. The archive center created a compilation of the selected segments, duplicated in sequence.

Methods of Data Collection

Video Tape Data Collection. The total collection of evening news broadcasts in the Vanderbilt Archive is indexed. The index is based on the descriptive abstracts of each news segment and is designed for the retrieval of each news segment from the tapes of the entire broadcast. The indexing is specific. For example, items dealing with Los Angeles, California are indexed under Los Angeles, not California.

The relevant segments were identified in the Television News Index and Abstracts. These segments were located by a review of the alphabetical index which refers to the cited page number in the abstracts. The index is oriented primarily to topic, institution, and personality, rather than the locale of the report.

Early segments were listed under the heading aerosol spray cans. Between the years of 1975 to 1977 relevant news segments were listed under the general heading of atmosphere, subdivided into aerosol spray cans and ozone depletion, and cross listed under aerosol sprays. The general heading of aerosol sprays ended after 1978 after the ban. The subheading

of ozone depletion began in late 1974 under the general heading of atmosphere. Beginning in 1981 the subheading of greenhouse effect appeared. The subheading of ground level ozone appeared during the late 1980s, however, this sub-issue usually occurred in segments also covering the greenhouse effect and/or ozone depletion.

Some headings in the index were listed as atmospheric research over the years. This heading referred to research on climate, weather prediction, storms and other turbulences of the natural environment. No research regarding ozone depletion and the greenhouse effect were listed under this general heading.

A compilation of the selected segments was ordered and received from the Vanderbilt Archive. The relevant news segments were ordered by providing Vanderbilt Archive the following information: each segment was listed by network in chronological order, including the date, page number of the segment as appearing in the Vanderbilt News Archive Index, the time which the segment started and stopped in the newscast, the total time of the segment, and a brief description of the segment.

All segments dealing with atmospheric deterioration during the fifteen year time period are used in the analysis. A total of 108 news segments constitutes the compilation.

After obtaining all atmospheric deterioration news segments each segment was coded and subsequently a Statistical

Analysis System (SAS) file was created (SAS is an integrated system for data management and statistical analysis and a major statistical package used in the social sciences). SAS was used because it is a flexible system for data analysis. Descriptive statistical analyses were performed on this data, producing frequency distributions and cross tabulations. The coding scheme for video tapes (see Appendix) was devised as follows. The name of the source interviewed and/or referred to was coded. Three other categories were also created as they related to how claims-makers framed the environmental problem. These categories included causes of, consequences of, and solutions for atmospheric deterioration. Another category involved noting conflict, including the claims-makers involved. A claims-maker was considered engaged in conflict if he/she explicitly took issue with another source, or if the news reporter pitted the two sources against each other during commentary.

The above categories were initially formed with the intention of performing quantitative manipulations and performing frequency counts. As the research process developed and as the theoretical orientation moved toward a constructionists approach, however, the focus of the research and the thrust of the methods moved to theme development over time in general, and individual claims-makers in particular. The coding scheme thus was an intermediate step used to locate themes, segments, clips, and individual statements. The

coding scheme provided an overall view of the data. The details of the categorization design sensitized the researcher to the evolution and comprehensive patterns of themes.

Each news segment was then transcribed by date, network, and the source making the statement. After all news segments were transcribed and coded, a separate Word Perfect file was compiled in chronological order consisting of all news segments involving a particular claims-maker. Finally, each type of visual used was noted (still photo, film, animation, graph), along with a brief description of the content of the visual.

The next chapter examines the process and natural history of the issue of atmospheric deterioration as presented on television evening news. This process is examined in light of Spector and Kitsuse's four stage natural history model of social problems. The chapter focuses on similarities and differences between the television news career of the issue and this natural history of social problems.

CHAPTER 4

THE PROCESS AND NATURAL HISTORY OF THE ISSUE

Introduction

This chapter focuses on the emergence and development of the television evening news career of the issue of atmospheric deterioration. The particular sequence of events and claims-making activities of this issue are unique. Most research using a constructionist approach points to a change in the definition or the reemergence of a social problem, attempting to explain the renewed interest in the issue. This study, however, analyzes a social problem that did not exist (socially) prior to its emergence on television news.

Of particular interest is the fit between the heuristic, four-stage natural history model of social problems posed by Spector and Kitsuse (1977), and the development of the issue of atmospheric deterioration on television news. According to Spector and Kitsuse (1977) the first stage consists of the emergence and presentation of claims. The first part of this chapter, however, emphasizes the relevance of prevailing circumstances prior to and during the emergence of the problem in orienting the focus of claims, in shaping how television news first framed the problem, and in influencing the progression of claims-making during the television career of the problem.

The scientific context in which the discovery of the problem unfolded is also briefly reviewed. This process of scientific discovery is also viewed as socially constructed. The ozone depletion theory presented by F. Rowland and Mario Molina in 1973 was the culmination of research over seven years by several groups of scientists looking at various possible sources of ozone harm. This scientific process is viewed as a form of social interaction during which researchers gained orientation from the studies of other scientists.

The recognition of claims by official institutions and governmental agencies is designated as the second stage by Spector and Kitsuse. There have been many research projects, task forces, committees, hearings, and conferences formed in response to the problem of atmospheric deterioration throughout the years. The following list of a small percentage of such activities indicates the range of institutions involved in the issue over the years: Dec. 1974, hearings amending the Clean Air Act by House Subcommittee on Public Health and the Environment; June 1975, IMOS defers decision to regulate CFCs pending NAS report; Sept. 1976, NAS report verifies Rowland-Molina hypothesis; March 1977, U.N. Environmental Programme holds first international meeting to discuss ozone depletion; Oct. 1978, CFCs in aerosols banned in U.S. by FDA, CPSC and EPA; EPA announces U.S. intention to freeze CFC production at 1979 level; Aug. 1981 NASA scientist

reveals records of 1 percent ozone decline; April 1983, at international talks, Norway, Sweden, and Finland submit plan to limit CFCs; March 1985, Vienna Convention signed by international negotiators; Sept. 1987, Montreal Protocol signed for CFC reduction; June 1988, scientists point to manmade pollutants causing greenhouse effect; March 1989, developing countries oppose CFC reductions; Oct. 1990, U.S. and five other countries oppose CFC reduction plan.

Although there have been a myriad of institutions involved in the ozone depletion/greenhouse effect issue, the regulatory agencies have carried the responsibility of implementing social policy regarding the problem. Thus the decisions and actions of these regulatory agencies are described as they progressed over the fifteen year history of their involvement. Complaints concerning the response, or lack of it, of official agencies, mark stage three according to Spector and Kitsuse's model. However, criticism of the claims of official agencies has been ongoing since the emergence of the problem. Instead of existing as a separate stage, criticism of official agencies has occurred throughout the career of the issue. Finally, stage four is characterized by attempts to develop alternative approaches to those offered by official institutions. This development has not been reported by television news. There have been consumer and environmentalist activities that suggest the beginning of a fourth stage. The move toward international involvement with

the issue also reflects some of the characteristics of what Spector and Kitsuse describe as a fourth stage.

Pre-Stage: Conditions Existing Before the Emergence of the Issue

A number of adventitious incidents existing before the recognition of the problem greatly influenced how the issue emerged and developed over the years. In this instance, a separate controversy existed concerning harm from aerosol spray cans prior to the emergence of the ozone depletion problem. This controversy became linked to, and symbolized, the cause of the problem. This happenstance connection would eventually divert attention from the more global aspect of ozone depletion and trivialize the implications of the problem.

By coincidence, the emergence of the problem of ozone depletion on television evening news was preceded by the issue of aerosol spray can danger. On February 20, 1974, both CBS and ABC covered the problem of exploding aerosol spray cans which were estimated to be causing 12,000 injuries per year. The exploding spray can problem contained the essential ingredients for a controversy. The aerosol spray can was a specific cause associated with the problem. Statistics demonstrating the gravity of the consequences were given. Two opposing groups were identified: the consumer group, The Center for Science in Public Interest, and the aerosol spray

can industry. The Center for Science in Public Interest had petitioned the Consumer Product Safety Commission (CPSC) to hold hearings on the problem by November 1973 (Donohue, 1975).

In another unrelated, yet significant development, CBS announced on April 3, 1974 that the Food and Drug Administration requested a Clairol recall of one hundred thousand cans of aerosol hair spray containing vinyl chloride, a chemical linked to a form of liver cancer. Three news segments (CBS, 2/20/74; ABC, 2/20/74; CBS, 4/3/74) dealing with two different types of harm from aerosol spray cans appeared on national evening news several months before Rowland and Molina first discussed their theory of atmospheric deterioration publicly at the American Chemical Society meeting in Atlantic City.

After the first national television news announcement of possible ozone harm (CBS, 10/3/74) from aerosol spray chlorofluorocarbons, the issue of harm from aerosol spray cans themselves, and the products in them, continued as an issue. On April 10, 1975 Harry Reasoner of ABC, announced that a group of George Washington law students had urged the government to require labels on aerosol cans in order to show the amount of propellant gas (chlorofluorocarbons) in the cans. "The group charged that up to 95% of the product may be simply propellant." It is doubtful that this seemingly minor action would have been considered newsworthy if the ozone depletion problem had not emerged.

The claim of excessive amounts of propellants in spray cans was raised again several months later. As stated in an editorial in the aerosol trade journal Soap/Cosmetics/Chemical Specialties, "A fuss over the amount of propellant in an aerosol container has been raised by Action for Safety and Health, one of those Washington consumer outfits" (Nov. 1975:12). The editor placed the blame, in part, on media coverage of the issue when he stated, "Newspaper stories based on these percentages make it seem as though aerosols were adulterated and Congress had better pass a law requiring the propellant percentages be shown on the label to protect the shopper from a rip-off" (p. 12).

In yet another twist to the problems with aerosol spray cans, ABC reported on May 9, 1975 that the CPSC was holding hearings on the deaths of people who had inhaled the cooking product Pam. It was noted that an average of 125 people, generally teenagers attempting to achieve a "high," died each year from the propellant. Although no specific mention of chlorofluorocarbons was made, the reporter noted that it was not the substance in the product that created the danger, but rather the gas propellant.

The aerosol industry had made internal hazard assessments of their products for years before the problem became an issue. As the problem gained attention, a system for rating aerosol "misuse hazards," as the industry called it, was offered by aerosol manufacturers. This rating system was put

forth by manufacturers to avoid a mandatory warning label for all aerosol products (Grochoski and Jacqmain, 1974). As the industry spokesman stated, "Such a warning on products that do not present such a hazard may only shatter the credibility and effectiveness of such labeling" (p. 57).

The aerosol industry had reason to be concerned. As Mazur (1981) shows in his work on the dynamics of public protests against technological innovations, such social movements follow a cycle during which media coverage of protests broadens the base of public protest. This may, in turn, lead to a mass movement. Although the gravity of concern and claims would become more severe as the ozone depletion issue became attached to aerosol spray cans, an easily identified focus for claims had been established.

On May 29, 1975, all three networks reported an FDA proposed ban on aerosol antiperspirants sprays containing zirconium, a chemical that had been linked to serious and permanent lung damage. According to an article in the aerosol trade journal, Soap/Cosmetics/Chemical Specialties (January, 1975), appearing five months before the networks' coverage, Proctor and Gamble had thoroughly tested zirconium "including extensive inhalation testing prior to marketing" (p. 22). Prior to the decision to ban zirconium, an advisory committee of the FDA had made public their scientific assessment of zirconium's risk and held a public meeting for rebuttals by interested manufacturers.

The combined effect of the identification of several forms of dangers, from both the substances in aerosol spray cans and propellants, led the FDA to tighten up labeling requirements in February, 1975. Although nightly television news did not cover this FDA action, the aerosol industry was becoming defensive over the growing adverse publicity. An editorial in an aerosol trade journal reviewed the various forms of labels. Industry's frustration was reflected in an article that stated: "All in all it appears the FDA is out to prove to Congress that it does not lack the power or will to regulate cosmetics" (March, 1975:14). This, however, was only the beginning of what would become a full-scale counter attack by industry.

The aerosol spray can problem related to explosions, vinyl chloride, zirconium, inhalation, and the large amount of propellant in each can, was unrelated to the more serious and global problem of ozone depletion. However, this problem was a significant development that worked to create preconditions which gave focus to the atmospheric problem and identified some of the key claims-makers who would reemerge as the ozone depletion problem gained momentum.

In focusing on aerosol spray cans, media had framed the problem as a consumer problem. An ABC reporter concluded a May 9, 1975 news segment by suggesting that, "There are a number of things that consumers can do to protect their family from the dangers of aerosol containers. They can read the

labels thoroughly and keep the cans from their children." The responsibility of safety, the reporter suggested, rested with consumers' proper use of the products.

Although the cause of the ozone depletion problem had been identified with chlorofluorocarbons by television news and other media, the aerosol spray can had come to incarnate the problem. Television news needed a concrete symbol that the listening audience could identify with. The ozone depletion problem was invisible, slow developing and possessed no objective status in terms of the experience of people. The aerosol spray can dominated visuals used during news segments. It appeared in stills behind the anchor. Footage of spray cans in stores and on the production lines of industries were often shown.

In conjunction with other media and ongoing legislation, network television news framed ozone depletion as a consumer problem. By framing the issue as a consumer problem network news also reinforced the assumption that the CPSC and FDA should take primary responsibility in implementing solutions. The EPA would later assume responsibility for the ozone depletion problem but, as will be shown in the next section, only after some confusion and controversy concerning which agency would be responsible for "solving" the ozone depletion problem. The legacy of this initial frame, it will be suggested later, may have contributed to the false sense of finality and dearth of media attention to the problem once

aerosol spray cans were banned in 1977. This misguided association gave more time to, and increased the effectiveness of, the stalling tactics used so effectively by industry.

Although problems of exploding spray cans and suspected consequences of the spray can's chemicals were unrelated to the issue of ozone depletion, this formative stage of the social problem shaped the ways complaints were raised, the strategies used to press claims, and the manner in which controversy was aroused later, as the CFC problem emerged. Agencies became involved and task forces were formed to deal with these early problems of aerosol spray cans. Adversaries had been identified. The claims-making process had been shaped.

Scientific Background of the Discovery of Ozone Depletion

Introduction. Formulation of the fluorocarbon/ozone theory came about after several years of research by scientists working along separate lines of study. A review of the scientific process that led to the generation of the ozone depletion theory demonstrates the social nature of science.

In 1966, several researchers pointed out that water vapor from exhaust emitted by the proposed supersonic transport (SST) program would deplete the ozone layer. Another unrelated line of research involved a British scientist who spent several years measuring fluorocarbons in the atmosphere. He was motivated to measure the chemicals out of pure

curiosity, having no idea that the chemicals would later be found harmful to ozone.

Other scientists were searching for possible sources of chlorine in the atmosphere because this chemical was known to create a chain reaction that destroys ozone. However, there was no known source producing significant amounts of chlorine in the atmosphere during the late 1960s and early 1970s. A research team from the University of Michigan and a team from Harvard University were studying NASA's space shuttle because the exhaust was known to produce small amounts of chlorine.

Finally, two researchers from the University of California at Irvine synthesized the relevant strands of research and added their own analysis of fluorocarbons in formalizing the fluorocarbon/ozone theory in 1973. Some of these early researchers would become sources for television evening news interviews, explaining the gravity of the issue and pointing to their calculations in estimating rates of ozone depletion.

Review of Research Suggesting Ozone Layer Harm. One of the first warnings of possible ozone harm was given by Dr. J. Hampson in 1966. He maintained that the planned production of SSTs could pose problems for the ozone layer because several hundred planes would be flying close to the ozone layer. The water vapor from their exhaust, Hampson contended, would react with and deplete the thin layer, leading to increased amounts

of skin cancer from greater exposure to ultraviolet rays (Fisher, 1990).

Hampson's warnings received corroboration from Halstead Harrison, of Boeing Aircraft Corporation, the company designing the SSTs. In 1971, hearings were held by Congress to determine if the SST program should be continued. During the hearings, representatives of Boeing maintained that the relation between ozone depletion and increased skin cancer was only a theory and should not hinder production of the fleet of planes. The issue came to an end, however, when the House of Representatives withdrew all project funding for economic reasons.

In 1970, Dr. Lovelock, a British scientist, was interested in measuring the amount of fluorocarbons in the atmosphere, unaware that he was studying chemicals that would later be found to be destroyers of ozone molecules. He was a freelance scientist who had designed a sensitive device for fluorocarbon measurement. He started his analysis in his home and in 1971 and 1972, further measured the chemicals from a ship sailing from Britain to the Antarctic and back. He published the results in the scientific journal Nature. Although the paper was not considered important at the time, his measurements of fluorocarbons would later prove to be valuable, allowing forthcoming researchers to make the connection between fluorocarbons and ozone depletion (Dotto and Schiff, 1978).

Another early figure in the ozone issue was Harold Johnston, a chemist working at the University of California who had, for several years studied the effects of supersonic transports (SSTs) on the ozone layer. Johnston and other scientists were becoming convinced that the growing number of planes could create serious problems with the ozone layer. Johnston was in contact with other atmospheric scientists working on the topic of chlorine in the atmosphere. Although it had been known for some time that chlorine could cause a chain reaction in the upper atmosphere and destroy ozone, there were no significant sources known that released chlorine in the atmosphere.

Johnston was involved with other scientists working on the possibility of chlorine harm to the ozone layer. In September of 1973, Johnston attended a meeting at Kyoto, Japan during which scientists discussed the possibility of ozone harm from chlorine. Two papers on this topic were presented by a research group from the University of Michigan and another by a research team from Harvard University. However, these scientists were not looking at fluorocarbons as a sources of chlorine. Instead, they concentrated on the space shuttle scheduled to begin operation in the 1980s. The exhaust of the shuttle, they knew, would produce hydrogen chloride, a source of chlorine. The research of Lovelock, Johnston, and the researchers from Michigan and Harvard provided an important backdrop for the work of the originator

of the fluorocarbon/ozone theory. A radiochemist, F. Rowland, studied the reaction and decay of molecules, though had little knowledge of atmospheric science. He was invited to attend a 1972 conference of the Atomic Energy Commission, a meeting designed to bring meteorologists and chemists together, two groups of scientists that were unfamiliar with each others at the time (Roan, 1989). At the meeting, Rowland heard about Lovelock's measurements of fluorocarbons. He found it curious that Lovelock's measurements of fluorocarbons in the atmosphere were close to the amount of fluorocarbons that had been produced. One year later, Rowland submitted a grant to enable research on fluorocarbons in the atmosphere. The amount of CFCs being produced gave reason for alarm. Rowland's assistant, Morio Molina, found that about one million tons were produced by industry world-wide. Their research found that once the chlorine molecules reached the upper atmosphere, the molecules were destroying approximately 100,000 ozone molecules. At this rate, Molina and Rowland calculated that between 7 and 13 percent of the ozone layer would be destroyed during the next 100 years. The two chemists' calculations were startling.

In order to gain insight into the matter, Molina and Rowland turned to Harold Johnston, the chemist who had speculated that gases given off by supersonic jets could cause ozone depletion. Johnson had suspected that oxides of nitrogen, another gas given off by SSTs, could also have a

depleting effect on the ozone (Johnston, 1971). Upon the advice of Johnson, who recognized the significance of their calculations, Rowland and Molina wrote a paper about their theory of the effects of CFCs on ozone depletion and submitted the paper to the British journal Nature. The implications of their paper were, of course, more far reaching than those regarding space shuttles and SSTs since their study dealt with a major source of chlorine which pointed to a large-scale concern.

In the article, Rowland pointed out that practically all of the fluorocarbons that had ever been released still remained in the lower part of the atmosphere. This he had learned from Lovelock's research. The journey of the chemical to the stratosphere would take 50 to 100 years. The implications for the ozone layer were grave; the process of ozone depletion would get progressively worse for decades to come. A total ban on the chemicals would not stop the continuing decrease in the amount of ozone.

The other two research teams, from the University of Michigan and Harvard, published papers corroborating the study while adding precision to expected rates of ozone depletion based on their computer calculations. The Michigan team suggested that ozone destruction would peak by 1990 and would remain a problem for decades to come. The two researchers from the University of Michigan, Ralph Cicerone and Richard Stolarski, had published a paper in a special edition of the

Canadian Journal of Chemistry documenting possible ozone harm related to hydrogen chloride gases emitted from solid-fuel rockets. In the same edition, the two Harvard researchers, Michael McElroy and Steven Wofsy, pointed to similar findings regarding reactions by chlorine given off by the space shuttle rockets. The Harvard group stated that if the increased production of fluorocarbons remained the same, about 10 percent a year, an ozone depletion of 14 to 15 percent would occur by the year 2000.

In September of 1974, Rowland and Molina presented their theory to the American Chemical Society. It was at this meeting that the scientific study of the possible problem would first be exposed to the media. At this meeting, reporters from the UPI and AP were present, prompting an official of DuPont, the leading producer of CFCs, to question the need to publicize the theory. Only a few days later CBS (10/3/74) made the initial announcement of the hypothesis. Thus began media coverage of the problem and the long running debate between scientists and industry that would turn the scientific observation into a social issue.

When Rowland and Molina presented their study, they pessimistically estimated that if CFC production continued to increase at the present pace of 5 to 7 percent a year, measurable ozone loss would occur by 1995. This would amount to a loss of 30 to 50 percent of ozone by 2050. The researchers extrapolated expected increases in skin cancer and

climatic changes and suggested a ban on chlorofluorocarbons, an \$8 billion dollar industry in the U.S.

Stage 1: Emergence of the Problem in the Media

There are several critical concerns during the formative stage of social problems that allow for the emergence and social recognition of the problem. Spector and Kitsuse (1977) point to three characteristics of the process of making claims which influence success in the establishment of a social problem: "the power of the claims-making group, the nature of their claims, and the strategies and mechanisms for presenting claims" (p. 143). Each of these features had relevance in aiding the emergence of the ozone depletion problem.

The Power of Claims-Making Groups and Mechanisms for Pressing Claims. Scientists are often portrayed by news media as "remote but superior wizards, above ordinary people, culturally isolated from the society" (Nelkin, 1987:15). Such images accent a mystique of science and a conception of scientists as celebrities. The portrayal of scientists as authoritative experts was a common image reflected by television news coverage of the ozone depletion issue. During the first news segment covering the ozone depletion issue, news reporter David Calhain, of CBS, emphasized the prestige of the scientists first making the claim of ozone harm as he stated, "Now scientists that come from Harvard, the University

of California, and the University of Michigan have published research suggesting that the fluorocarbons from aerosol cans are drifting up beyond the ozone layer" (CBS, 10/3/74). The provocative claim was given legitimacy by referencing the sources to prestigious universities.

Rowland and Molina's paper in Nature appeared in June, 1974, but did not immediately emerge in the media. These scientists were to learn that scientific discovery of a significant problem did not automatically lead to wide publicity and social recognition. Media attention grew slightly after the two chemists presented their paper at the American Chemical Society meeting in Atlantic City in September of 1974. Dorothy Smith, the ACS news manager, had taken notice of the paper as she read through the hundreds of abstracts of papers presented during the week long meetings (Dotto and Schiff, 1978). During a news conference, held after the meetings, Rowland and Molina's theory was explained last, at which time most of the best-known reporters had left. The two scientists had discovered that, "In the deadline-distorted world of competitive journalism, one does not withhold the biggest news until the end" (Roan, 1989:27).

The power of the claims-makers and the perceived legitimacy that aided the emergence and recognition of the theory was achieved as Rowland and Molina gained backing from other highly respected scientists. As Spector and Kitsuse (1977:145) point out, "By entering into a coalition with

others, a group may gain numbers, prestige, institutional authority, or other advantages." A second paper by two University of Michigan scientists, Cicerone and Stolaski, confirmed and added to the original analysis and "gave Rowland and Molina a big boost of credibility" (Roan, 1989:28).

The most significant breakthrough, in terms of the emergence of the issue in the media, occurred after Harvard University's Michael McElroy and Steven Wofsy predicted a 10 percent annual increase in CFCs, an increase that would reduce the ozone layer by 10 percent in 20 years and 40 percent by 2014. The Harvard research team's prediction came two weeks after Cicerone's paper was published. McElroy was better acquainted with public relations than Rowland and Cicerone and was quoted extensively by The New York Times science writer, Walter Sullivan (Roan, 1989). Thus the original claim of ozone harm did not fully emerge in the media until it was expressed through the collective claims of several respected researchers.

The Nature of the Claim. There was a unique emphasis in the research by McElroy and Wofsy that made their claims more attractive and allowed their claims to emerge more fully in the media. Their claims contained specific predictions of the consequences of increased production of CFCs. While McElroy's research did not add much to the original theory, his research emphasized projections of specific amounts of ozone loss. The

scientific claim was more precise and the consequences were more concrete (see section on Scientists in next chapter).

Spector and Kitsuse hypothesize that precise claims are more likely to emerge as viable social problems. They suggest that "The more vague the sense of dissatisfaction, the more diffuse and general will be the claim and the less likely will be the recognition or response to the claim" (1974:144). This assumption would seem to be especially true for ambiguous and arcane scientific claims such as the prediction of ozone depletion.

McElroy's projections also emphasized the seriousness of the problem. Bossard (1941), in one of the earliest natural history schemes of social problems, emphasized the critical role of stressing the seriousness of a problem. In a commentary on Fuller and Myer's (1941) brief natural history scheme, Bossard suggested that a discussion of the seriousness of the problem immediately after the recognition of the problem is an important feature that aides the emergence of a social problem.

Assertions of Claims and Social Controversy. According to Spector and Kitsuse (1977), the development of social controversy is the culmination of stage one in the natural history of social problems. However, social controversy has been a feature of both the ozone depletion issue and the greenhouse effect issue throughout their media careers.

Scientists making claims that ozone depletion was inevitable provoked reactions from industry spokesmen and other scientists skeptical of these claims. Industry challenged the claims of scientists, planned their own campaign, and lobbied against the proposed changes.

Support for the theory deepened during the later part of 1974 as did a counterattack by the CFC industry. Along with the CFC industry, the aerosol spray can industry joined the counter assault. The aerosol spray can industry trade journal, Soap/Cosmetics/Chemical Specialties, (October, 1974) ran an editorial imploring the spray can industry to remain steadfast in their defense of their product and maintained that the media was engaged in a vendetta against the industry.

The company with the most at stake, and the company that would appear most often on television evening news, was DuPont. DuPont was the largest of the six U.S. manufacturers of CFCs, generating an \$8 billion per year business. The company used good public relations and a stalling tactic that would prove effective until the late 1980s. They insisted that solid facts were needed, that the claims by scientists thus far had been only hypotheses, and that if conclusive evidence was found the company would not continue to manufacture CFCs.

Stage 2: Official Response to Claims, Recognition of Legitimacy, Involvement and Formation of Agencies, Official Investigation

The response by governmental agencies to the claims of possible ozone harm from CFCs was swift and introduced a stage in the television news career of the issue that would continue through 1989. The scientists who had previously worked independently were suddenly thrown into the world of politics, of official proceedings, of task forces, and congressional subcommittee hearings. Having grown slowly from the kernel of scientists who had worked in obscurity, the constituency had now broadened. Scientists were pressed for documentation of their claims.

The movement of the scientific claims to the realm of governmental agencies also created what has been a lasting transformation to the development of the social problem. Scientists lost some control over the claims that they had put forth. The issue gained visibility. As many studies of media sources have shown, journalists found it convenient to follow the mainstream avenues of obtaining information; typical sources of the news beat, such as governmental agencies and press releases, were now routinely used (Molotch and Lester, 1975; Bowerman, 1979; Epstein, 1973; Gans, 1979; Altheide, 1976, Signal, 1973). Television news coverage of the issue escalated: 6 segments in 1974; 15 in 1975; 10 in 1976; and 9 in 1977. Reports from the large number of various committees

served to define and redefine the issue. Although the scientists who first discovered the ozone theory lost some control over the issue, the numerous agencies and official proceedings still depended on them since the number of experts of the issue remained small.

As described by Popper (1970), another feature of investigating commissions is the tendency toward partisanship and an inability to have their recommendations adopted. However, the main transformation which took place once the issue was adopted by governmental agencies was a delaying of substantive response and a tendency to refrain from passing judgement concerning the gravity of the problem. As a result, the number of agencies and committees involved with the issue grew during the three year period from 1974 to 1977. As Spector and Kitsuse (1977) point out, "This pattern fosters the belief that commissions reform by public relations, in which the commissions studying a problem are taken to be substance of reform itself" (p. 150).

Television News Coverage of Regulatory Agencies.

Television evening news has covered the activities of regulatory agencies responsible for the safety of products containing CFCS as well as the control of other sources of gases contributing to ozone depletion and the greenhouse effect. Over the fifteen years of news coverage of these issues, attention has been given to a variety of activities by

these regulatory agencies. National news segments have focused on a variety of regulatory activities: holding hearings, recalling products, suggesting warning labels, proposing bans, and attending international conferences. While regulation of ozone depleting gases has a long history, beginning in 1974, regulatory action specifically aimed towards curbing the greenhouse effect began much later, during the late 1980s.

Regulatory control of fluorocarbons has been fragmented during the fifteen year history of the ozone depletion issue, and has involved three agencies: the Food and Drug Administration (FDA), the Consumer Product Safety Commission (CPSC), and the Environmental Protection Agency (EPA). During the mid 1970s the FDA and CPSC were responsible for the safety of specific types of products. As a consequence, there was no uniform approach to the regulation of aerosol spray cans and fluorocarbons. The EPA's involvement with fluorocarbons slowly emerged as the aerosol spray can issue came to an end, as FDA and CPSC involvement waned, and as concern turned toward other sources of fluorocarbon emissions.

Television evening news segments involving regulatory agencies have drastically changed over the past fifteen years as have the focus of these agencies. News segments became longer and came to involve more interviews and references to news sources. Complexity progressively increased over time as more recent segments trace the interconnection among

ecological variables involved in both the ozone depletion issue and the greenhouse effect. The most noteworthy change in national evening news segments dealing with regulatory agencies was this changed focus. The focus moved from the specific causes of a problem of the United States to global concern and international cooperation.

The FDA, CPSC and EPA have received pressure from scientists, industry, politicians, environmentalists and other actors with vested interest in regulatory decisions. The agencies have wavered, many times being cautious, waiting for the results of studies, suggesting further studies, or declining direct action by claiming insufficient knowledge for regulatory action. But at other times decisions by regulatory agencies to ban or freeze the production of certain gases have come swiftly, often occurring after scientific confirmation or breakthroughs, or sometimes coming about immediately after a political faux pas or dramatic shifts in conflict among key actors involved in the issue.

Overview of the Three Regulatory Agencies. In 1974 the first television evening news coverage of the issue focused on possible consumer injury from spray cans and this concern fell under the provence of the Consumer Product Safety Commission (CPSC). At the time, the CPSC was responsible for controlling products such as household-cleaning propellants and refrigerators in homes and schools. According to the act

empowering the CPSC, the commission is to promulgate product safety standards to prevent unreasonable risk of injury.

The FDA also shared the spotlight during the first years of news coverage of the aerosol can/fluorocarbon issue. As the focus of attention moved to the substance in the spray cans, the FDA became involved in actions of regulatory control. The act that established the FDA states that the administration is responsible for prohibiting the manufacture of "adulterated food or cosmetic." The FDA controls drugs, food, and cosmetics including hair sprays and deodorants, the most common products used in evening news visuals demonstrating the release of CFCs. The FDA had regulatory control over a large share of fluorocarbon products in 1975 including forty percent of CFCs produced in the U.S. and eighty percent of spray cans using fluorocarbons (Stoel et al., 1980).

As the spray can issue came to an end in 1977, regulatory responsibility of CFCs, and later other greenhouse effect gases, came under the province of the EPA, as the CPSC and FDA faded from television evening news coverage along with coverage of the aerosol spray can issue. Created in 1970 in response to the growing ecological concerns of the 1960s, the EPA consolidated the regulatory powers that had been scattered among nine different agencies. Phase two of fluorocarbon regulation, that which focused on CFC emissions other than nonessential CFC-propelled products, became the responsibility

of the EPA. Amendments to the Clean Air Act, passed in August of 1977, dealt specifically with ozone protection and directed the administrator of the EPA to manage research while giving authority to regulate and safeguard the ozone layer.

The Consumer Product Safety Commission. The CPSC appeared in nine evening news segments from 1974 to 1977. During the first part of this three year period the issue of injury from spray cans and their propellants was the focus of news segments involving regulatory agencies. The CPSC opened hearings in February, 1974, in response to a petition from the consumer group, The Center for Science in Public Interest. Both ABC and CBS picked up on the analogy used during the hearings that "aerosol spray cans may explode like a hand grenade."

The regulatory decision faced by the CPSC concerned tightening controls on aerosol spray cans, an issue that was not acted on for over a year. Finally, the commission ordered manufacturers to change the design of the cans so they would not be sprayed in the wrong direction by the user. At the time of this first regulatory action, the other aspect of the issue, the possible harm to the ozone layer by chlorofluorocarbons, had been coupled with the problem of spray can danger, but the CPSC opted to direct their actions toward the more concrete and easily understood aspect of the issue. The possible harm from chlorofluorocarbons was much

less definite, and the CFC industry was a much greater foe than the manufacturers of aerosol spray cans.

The involvement of the CPSC with the issue was limited to a specific type of product: the aerosol spray can. This product, however, was pervasive to the life style of the viewing audience, and this theme was developed in the media during the early years of the aerosol spray can issue. On May 5, 1975, ABC used this angle in introducing a segment covering CPSC hearings when the anchorperson stated: "Aerosol sprays are used in the home for many things, everything from cleanser to shaving cream." The pervasive nature of the product was suggested when this anchorperson pointed out that "three billion cans are sold yearly in the United States."

The typical viewer could identify with this narrow issue involving a specific product commonly used by Americans. During the third appearance of the CPSC on evening news, the human interest aspect of the issue was captured by ABC as parents testifying before a CPSC hearing, related the story of their son's death from Pam Spray. The distraught parents produced a list of ninety names of adolescents who died after inhaling the product in an attempt to achieve a "high." The news reporter summarized the commission's findings that an estimated 125 people die yearly from aerosol spray cans.

A message that appeared in these early news segments was that not only could the average viewer identify with the problem but they could do something concrete about it. The

first hearings conducted by the CPSC were attended by industry representatives who were shown on television listening attentively to the distraught parents. Members of the CPSC would later give very explicit recommendations to "remedy" the problem. But in the meantime, as ABC's reporter suggested: "There are a number of things that consumers can do to protect their family from the dangers of aerosol containers. They can read the labels thoroughly and keep the cans from their children." The implication was that part of the problem rested with consumers' misuse of the product. The earlier claim by industry representatives that "the product presents no real hazard unless misused" seemed feasible within this context.

Placing the blame on consumer misuse appeared even more believable as the reporter pointed out that most of the deaths "are teenagers who inhale the product to achieve a high." Thus, the main problem was presented as irresponsible teenagers using the product as a drug, and this was an important message in this news segment. Blame was lifted from the manufacturer, as the spray can industry had limited control over such forms of misuse. Another feature of segments involving the CPSC was the debate between industry and the commission. During the first two segments of the issue in 1974 the focus was on public hearings by the commission. No decision on aerosol sprays was rendered by the commission but both sides of the issue were given. Industry

remained firm in their stand that aerosol spray cans were safe. One year later Walter Cronkite suggested the ongoing nature of the controversy, and more importantly, introduced for the first time the notion that sprays from aerosol cans presented danger to the atmosphere as he began the news segment by saying: "After much publicity and debate the CPSC said it will not ban aerosol sprays in spite of the hazards they may present to both the atmosphere and the people who use the sprays" (CBS, 7/23/75). With this introduction Walter Cronkite had moved the controversy from a personal hazard to an environmental problem.

At this point, the main threat posed by spray cans shifted from one of a potentially hazardous threat to consumers to one of danger to the environment. The Natural Resources Defense Fund had petitioned the CPSC to ban aerosol sprays in November of 1975 based on this shift in focus. According to a law relevant to such petitions, the CPSC was to comply with the petition or present a written denial in four months. The commission could not decide if they had the legal power and thus did not act. Michael Brown, the general counsel of the CPSC, suggested that this issue could have been the responsibility of the EPA. The response of the EPA was, "We take care of the lower atmosphere, and this is an upper atmosphere problem" (Fisher, 1990).

The city of Los Angeles also petitioned the commission, stating that ozone depletion could lead to more skin cancer.

The aerosol spray can industry was not the only adversary the commission faced in creating regulatory policy. The CPSC needed solid evidence that fluorocarbons were damaging the atmosphere. Questions regarding what would constitute scientific evidence were a central part of the issue argued by scientists and industry spokespersons during the first segments. It would continue to be a feature of the issue throughout its media career.

With industry remaining steadfast in the denial of harm from aerosol sprays and with no concrete, or overwhelming evidence from scientists suggesting harm, the CPSC turned to the public to assess attitudes about fluorocarbon-containing aerosol sprays. On November 18, 1976, ABC reported that "nearly two thirds of Americans polled in thirty seven states think that fluorocarbons should be taken off the market and nearly one half said that they have already stopped buying aerosol products containing fluorocarbons." Four days later ABC reported that "the CPSC today voted unanimously to call for a ban on the use of fluorocarbons because of a risk of damage to the earth's protective ozone layer." CBS similarly reported the proposed ban and mentioned the limited number of spray products which the commission had jurisdiction over.

Coverage of the FDA. Compared to coverage of the CPSC, news segments involving the FDA presented an administration taking action and making definite decisions. While in some

news segments the CPSC appeared to delay action pending the findings of research institutions, thus refusing to propose bans because of inconclusive data, each segment including the FDA reported definite action by the administration. The FDA appeared in seven news segments from 1975 to 1977. The first appearance of the FDA on television evening news was a CBS segment in which Walter Cronkite reported a recall of one hundred thousand cans of Clairol hair spray that contained vinyl chloride, a chemical linked to liver cancer. The announcement of the recall by Clairol came after a request by the FDA. According to Walter Cronkite, a spokesman for Clairol had said that the chances of harm were extremely remote. But as with other segments, the portrayal of the FDA was that of an agency that acted suddenly and unequivocally.

Three brief segments appearing on each of the three networks on May 29, 1975, covered the proposed ban imposed on aerosol deodorants containing zirconium, a chemical linked to lung damage. Each of the networks listed the brand names of the deodorants affected by the proposed ban. Both ABC and NBC noted industries' claim that the products were safe, while CBS did not. In general, however, the brief segments were quite similar.

During a November 23, 1976 news segment, the commissioner of the FDA, Alexander Schmidt, was shown proposing the warning label required on all aerosol spray cans of food, drugs, and cosmetics containing CFCs. Once again the action by the

administration seemed sudden and definite but the goal of the action, as stated by the commissioner, was also to "reduce consumer use of CFCs in aerosols by voluntary action." This strategy appeared effective; several studies during 1976 and 1977 indicated a dramatic decrease in aerosol spray can sales.

Conflict, Industry's Response. The reaction of industry against the FDA ban on products containing zirconium consisted of a mild disclaimer toward the scientific basis of the ban. The aerosol industry appeared to be defensive. In the above segment, an industry spokesman was reported to be surprised "at the FDA's haste in regulating aerosols" but "given the current climate, others in the industry are scurrying around looking for alternatives." It seemed the FDA had a strategic advantage the other two regulatory agencies lacked. For one, their actions were based on concrete research involving isolated, specific chemicals, determined to be linked to a personal or physical problem. Second, the administration's ploy of linking their bans regarding these specific chemicals to the more ambiguous problem of ozone damage from chlorofluorocarbons was possible because of the timing of the two unrelated, but seemingly similar situations. The attack on spray cans containing vinyl chloride and zirconium by coincidence had occurred during the early period of Molina and Rowland's theory.

But the significant battle between regulatory agencies

and industry had yet to take place. The second phase of the ban covering air conditioners and refrigerators was far more disturbing to industry than the ban on aerosol spray cans. In a CBS news segment on April 26, 1977, the proposed ban was announced by the commissioner of the FDA. As a consequence, the president of Air Conditioning and Refrigerator Institute stated that "the impact on our life styles will be tremendous and I don't think people will be willing to give up the standard of living they have now." In summarizing the news segment, the reporter was able to portend the future as he stated: "Banning the release of CFCs in spray can products is one thing, but stopping their use in refrigerants where they [industry] see no substitutes is an entirely different situation."

The final important announcement of a ban on aerosol spray cans using chlorofluorocarbons as propellants was announced fourteen days later. Although the three agencies were reportedly calling for a ban at the same time, the FDA began the regulatory process. Upon the recommendation of the Ad Hoc Federal Interagency Task Force on the Inadvertent Modification of the Stratosphere (IMOS), the head of the FDA, Alexander Schmidt, made the first announcement of the ban. During the announcement Schmidt stated: "The known fact is that fluorocarbon propellants, primarily used to dispense cosmetics, are breaking down the ozone layer. It's a simple case of negligible benefit measured against possible

catastrophic risk, both for individual citizens and for society" (Dotto and Schiff, 1978).

Immediately afterward, the CPSC followed the suggestion of the Natural Resources Defense Council to ban CFCs in nonessential spray cans. The EPA also publicly indicated its intention to propose regulation. In order to demonstrate consistency the three regulatory agencies created an interagency work group to organize their activities. On May 11, 1977, the three agencies announced a three step timetable for phasing out nonessential fluorocarbon spray cans.

Coverage of the EPA. The EPA appeared in seventeen news segments from 1977 to 1989. Of these seventeen segments, ten dealt with ozone destruction, seven with the greenhouse effect and one with both ozone destruction and the greenhouse effect. The number of EPA news segments occurred in the following years: 1 in 1977; 1 in 1979, one in 1983; 5 in 1987; 3 in 1988; and 6 in 1989. The only EPA segment involved with the aerosol spray can issue aired in 1977, when the agency joined the CPSC and FDA in announcing that a ban would take place on aerosol propellants within two years. The EPA officially entered the ozone depletion issue when the spray can issue came to an end.

Compared to the earlier segments involving the FDA, CPSC and the spray can issue, segments involving the EPA were longer and involved more interviews with, as well as

references to, other sources. The average length of the segment was over two minutes and included approximately two interviews. Besides interviews with EPA spokespersons, the most common interviews involved politicians, Natural Resources Defense Council spokespersons, citizens, scientists, DuPont spokespersons and the World Resources Institute.

Politicians have appeared five times during news segments involving the EPA, and have often been critical of presidents Reagan and Bush and their administrations. Senator Gore of Tennessee, for example, commented that President Bush moved slowly toward the correct position regarding global warming (ABC, 5/12/89). Representative Florio suggests that President Reagan's administration presided over a lost decade of environmental concern (ABC, 9/7/88). In an attempt to allay criticism against his administration, President Bush announced that he wanted the U.S. to lead in finding a solution to the greenhouse effect (CBS, 3/3/89). The EPA has not been without its critics. David Doninger, a spokesperson for the Natural Resources Defense Council points out that the EPA's plan to cut back on CFCs over the decade will not work. Referring to scientists' findings, he maintained that ozone depletion would get worse as more CFCs move slowly toward the upper atmosphere (CBS, 12/1/87). Comments such as those by a spokesman from the World Resources Institute suggesting that it would take over 100 years to close the ozone hole, also served as a check to the ambitious claims of the EPA. Although their comments

were critical of EPA's proposed remedies, they also served to accent the gravity of the problem and the need for more extreme solutions to the moderate long-term plans of the EPA. The comments also created a sense of balance in reporting by pitting a critical liberal assessment of the problem against the official announcements of public officials.

EPA segments focusing on the greenhouse effect dealt with the interrelatedness of ecological and sociological problems. For instance, five news segments covering EPA reports pointed out that global temperature change could lead to drought conditions and water encroachment in costal areas. These conditions, in turn, would lead to economic problems, possibly changing social relations. While earlier segments concerned with aerosol spray cans pointed to consequences related to specific products used by individuals, later EPA segments (ABC 9/7/88, CBS 3/5/89, ABC 3/6/89, CBS 7/27/89) extended the chain of consequences on a much larger scale of a social problem.

In addition to showing the interrelated nature of ecological problems caused by the greenhouse effect, news segments involving the EPA, on occasion, covered both ozone depletion and the greenhouse effect, explaining how the two issues are connected. An April 15, 1987 segment on NBC, for example, dealt in general with threats to the earth's atmosphere, while including causes and consequences of the greenhouse effect and ozone depletion. After explaining

implications of the greenhouse effect, the reporter stated, "and if that weren't enough, one of the gases that contributes to the greenhouse effect, chlorofluorocarbons, poses a deadly effect. It may deplete ozone from the stratosphere."

Veerabhadran Ramanathan, of the National Center for Atmospheric Research in Boulder, Colorado, pointed in 1975 that CFCs are also potent greenhouse effect gases (Ramanathan, 1989). Other gases in addition to carbon dioxide had been determined to contribute to the greenhouse effect in 1976. W. Wang and James Hansen of the Goddard Institute of Space Studies, had determined that methane, nitrous oxide and CFCs could have as much affect on the greenhouse effect as carbon dioxide.

The EPA has had intermittent coverage on national television evening news since the issue was first referred to in 1977. A 1983 ABC summary of an EPA report on the greenhouse effect was the only appearance of the agency on evening news until 1987. Acting upon a request from the White House, the National Academy of Sciences undertook a study of the greenhouse effect, yet the conclusions were moderate, as the authors concluded: "Overall we find the CO₂ issue reason for concern, but not panic." ABC did not cover this study, but instead picked up on a forceful EPA study that had been released earlier. The 1983 study made by EPA's Strategic Studies staff was called Can We Delay A Greenhouse Warming? This first major EPA study of the greenhouse effect presented

some alarming information and concluded that "agricultural conditions will be significantly altered, political institutions stressed" (Oppenheimer and Boyle, 1990).

An October 18, 1983 news segment pointed out that the EPA study "warned that major changes in our environment are coming much sooner than we expected." The news segment included other pessimistic details: some costal areas under water, some rivers valleys turning into swamp land and widespread global starvation. The dire consequences documented suggested the need for many cities to be protected by levies or be abandoned. Finally, the segment ended apocalyptically: "The scientists that put out the EPA report warn that without planning now, the social and economic, and political disruption from the greenhouse effect will be catastrophic for mankind" (ABC, 10/18/83).

In 1985, there were new scientific findings, an international conference, and congressional hearings dealing with the greenhouse effect, but none of these developments were picked up by national evening news. Scientists V. Ramanathan and Ralph Cicerone discovered that other gases were contributing to the greenhouse effect and would eventually surpass the influence of carbon dioxide on global warming. That same year, an international meeting in Villach, Austria arrived at the same conclusion. During Senate hearings in 1985, Senator John Cafée asked the EPA to develop some policy options to stabilize greenhouse gases in the atmosphere

(Abrahamson, 1989).

As stated earlier, twelve of the fourteen EPA segments occurred after 1987. There are several possible explanations for the late arrival of the EPA during the television evening news career of atmospheric deterioration. First, regulatory activity drastically slowed down after the aerosol spray can issue had been "resolved." Industrial giants such as DuPont proved much stronger adversaries than the aerosol spray can industry.

Second, political decisions by the Reagan administration partially explained the disappearance of the EPA from national evening news during the first three months of the 1980s. Deregulation of industry and the dismantlement of the EPA (resulting in the negation of environmental regulations and their enforcement), suggested why the EPA, especially in light of this issue, disappeared from national evening television news. The onslaught of the Reagan administration against the controlling of gases known to contribute to global warming and ozone depletion was pointed out during a September 7, 1988, segment. Reporter Ned Potter of ABC news explained how Americans and the government responded against pollution twenty years ago with such policies as tough controls against auto emissions. Potter stated, "But what happened? Many environmentalists point to this." Film footage of Ronald Reagan taking the presidential oath was shown and as the reporter continued: "When Ronald Reagan came to office, say

his critics, he brought the effort to a halt. Research money for energy conservation was cut in half. When the auto industry had trouble meeting emission standards, Washington loosened them" (ABC, 9/7/88). During an interview in the same news segment Representative James Florio stated: "This administration unfortunately will go down in history as presiding over what might be considered a lost decade of environmental concerns" (ABC, 9/7/88). Reagan however lost politically, as his offensive against the EPA failed. Ann Bufford resigned in disgrace and the deputy of the EPA, Rita Lavelle, went to jail for perjury.

The Move Towards International Involvement: "The Fourth Stage"? The focus of most EPA segments, especially those appearing in the late 1980s, is the global nature of the greenhouse effect and ozone destruction. These segments often detailed long-range implications for the world. Seven of the fourteen segments reviewed international involvement including the importance of worldwide cooperation in research, the implications of international treaties for global environmental protection, the role of the European community in fostering international cooperation, and the need to help developing nations by providing these countries with incentives to create environmentally safe forms of production. The significance of official statements made by EPA spokespersons was augmented then, by the world-wide scope of

the segments in which they appeared.

Emphasis on the global nature of ozone depletion during EPA segments was also evidenced by the variety and type of consequences mentioned. Although specific physical problems related to humans were discussed, such as increased cases of skin cancer, cataracts and diseases, other consequences not mentioned during earlier FDA and CPSC segments included other expected problems affecting crops, marine life, plants and animals. The scope of consequences of ozone depletion mentioned during EPA segments was more inclusive and less centered on specific human health problems than earlier FDA and CPSC reports.

In addition, international involvement in the control of gases contributing to the greenhouse effect and ozone depletion evolved slowly, taking off in the late 1980s. Although the 1983 segment summarizing the EPA report was pessimistic, in that it predicted major, catastrophic changes in the environment were coming much sooner than expected, the next EPA appearance on evening news in 1987 was upbeat. On September 16 1987, the first major international event covered by ABC and NBC evening news was the Montreal Protocol signed by 24 countries. These countries included the U.S. and the other major producers of chlorofluorocarbons (Fishman and Kalish, 1990). The agreement was portrayed as a triumph in international cooperation, representing ten years of negotiations striving to limit the production of chemicals

harming the ozone layer.

The reporter for NBC pointed out that EPA's Lee Thomas had signed the international agreement. During an interview, Thomas stated: "I fully intend to sell it to the U.S. Congress as a strong protocol, and one that is in the best interest to the world and to the United States" (NBC, 9/16/87). ABC news also depicted the agreement in a sanguine manner, referring to it as "a milestone in global environmental protection and a rare triumph of common good over national interest" (ABC, 9/16/87).

Three months later, the EPA's plan to formalize the Montreal agreement involving the freeze of the production and use of chemicals harmful to the ozone layer appeared much less optimistic in ABC and CBS follow up segments. The plan had called for a fifty percent reduction by 1999 and a freeze on halon production at its 1986 level. However, the difficulty of EPA's enforcement of such reductions, the propensity of governmental agencies to delay action for the sake of further study, and the avoidance by industry in complying had been demonstrated in the past and was now repeated, as deadlines were avoided or delayed.

Environmentalists, who had been cautiously optimistic after the Montreal agreement, now became cynical and took issue with EPA's plan. On a CBS news segment, David Doninger, of the Natural Resources Defense Council, maintained that the "reductions are not going to go far enough or fast enough to

stop ozone depletion." During the ABC clip, Donninger emphasized that the EPA plan "won't even stop the build up of these chemicals in the atmosphere, and ozone destruction that is already going on will continue and probably get worse." In an editorial in U.S. News and World Report, Harold Evans (1988) referred to the EPA and the President's science advisor as "the great procrastinators." Attempts by industry to lobby against unilateral action coming from the Montreal Protocol was noted by Lindley (1987) in Nature. A host of criticism was aimed at U.S. reluctance to take the initiative.

The problem that faced the EPA involved the need to simultaneously adopt a diplomatic position that would 1) allow industry time to develop substitutes for CFCs and 2) would present a plan that appeared capable of protecting the ozone layer. The Montreal conference had aimed toward international agreement on broad based policies, but in December of 1987, the EPA presented a formalized plan that involved specific policies. The EPA administrator attempted to justify the time frame for the implementation of the policy by stating: "We are a good ways from having substitutes that are equivalent. The ten year time frame, we feel, is sufficient for the development of those substitutes." The EPA reappeared in national news in July of 1988. The primary topic for the hot summer months was worsening ground level ozone pollution and possible evidence of the greenhouse effect, as many cities during these months had record high temperatures and high

levels of ozone pollution. During introductory comments, Connie Chung spoke of the lack of rain and a "heat wave forming up in the mountains." The topic was framed within "a weather report," and the blame of the ground level pollution problem appeared to rest with chance weather conditions.

On this issue the EPA appeared concerned and definite about the negative health consequences for citizens. During a July interview, Dr. Clay of the EPA, affirmed the dangerous situation created by ground ozone levels. "It harms the lungs. The burning sensation you have, you are hurting the cells in your lungs themselves." The format of the news segment suggested that, although emissions of carbon dioxide from cars and factories contributed to the smog problem, developments in the weather such as warm temperature, humidity, sunlight, and stagnant air were the central culprits creating the problem.

Two months later, the ozone problem, both upper stratosphere and ground level, was reviewed by ABC. Dr. Clay of the EPA again appeared in three short interviews accenting the difficulty of the problem, the harm to lungs, and most importantly, the world-wide nature of the problem. Unlike the previous NBC segment the culprit was clearly "---manmade chemicals called CFCs, wafting skyward from car air conditioners, and fast food containers." The reporter pointed out global ramifications of the issue, and that "the greatest cleanup efforts will come to nothing if the United States goes

it alone."

This global theme of both the greenhouse effect and ozone pollution continued throughout the rest of 1988 and into 1989 EPA segments. In August, 1988, CBS and NBC presented a pessimistic draft report from the EPA, which accented "changes possible for planet earth," irreversible effects upon crops, as well as air pollution and acid rain.

The theme of international involvement was developed more fully in 1989 during news segments involving the EPA. Dan Rather, in the introduction to a March 5, 1989 CBS segment, said: "The international pressure is on." During an international conference in London, Margaret Thatcher was shown talking to leaders of developing nations in an attempt to persuade them to "aid the industrial nations which have now agreed to phase out CFCs." The director of the EPA, William Reilly, echoed this theme of the importance of working together.

It became apparent that realization of the ambitious goal of achieving international cooperation and establishing worldwide policies to curb the production of CFCs was a formidable task. The need to equitably distribute cost of such policies was the topic of a March 6, 1989, ABC news segment covering an international meeting of one hundred and twenty nations in London. Some Eastern country delegates at the meeting pointed to the need of Western countries to lead in paying for development of costly alternatives. However, during an

interview in this news segment, EPA director William Reilly, remained staunch, insisting that Eastern countries should help in making the transition to "ozone friendly" chemicals. As ABC reporter, Mike Lee, pointed out, "The U.S. has responded with caution."

A change in the posture of the EPA was developing regarding policies controlling CFC production. The full extent of EPA's changed posture became more apparent during an international conference on global warming in the Netherlands late in 1989. Of the nations represented at the conference, sixty three favored setting reductions of carbon dioxide, including all Western European countries. Six nations opposed, "led by the United States, joined by Japan and the Soviet Union."

NBC captured the changed position of the EPA by contrasting William Reilly's statements in April of 1989 and later in November:

Reporter: Environmental Protection Agency Chief William Rielly last April.

Rielly: Carbon dioxide in the atmosphere has increased by twenty five percent in one hundred years. Something significant may be occurring. We dare not ignore it.

Reporter: Now Rielly at today's [November] conference in the Netherlands.

Reilly: We do not come here prepared to make a commitment to stabilize CO2 emissions by the year two thousand.

Conclusion

This chapter traced the development of the television news career of the issue of atmospheric deterioration. A comparison between this issue development and the four stage natural history model proposed by Spector and Kitsuse reveals similarities, but also some significant differences. Unlike Spector and Kitsuse's model, this analysis emphasizes the importance of circumstances existing prior to the first stage of development. These circumstances shaped how the issue was initially framed by newscasts and how the issue evolved over time.

The second stage was marked by the onset of controversy and the involvement of official agencies. Controversy, rather than a characteristic of any one particular stage, was frequent and occurred from the beginning of the issue. The third stage, marked by criticism and reemergence of claims due to dissatisfaction of official response also was a feature throughout the television career of this issue. Finally, the fourth stage during which claims-makers search for alternative activities to those of official agencies responding to claims has not occurred, or at least has not been covered by television news.

The model formulated by Spector and Kitsuse is hypothetical and exploratory. No single generic model can possibly account for the unfolding of social action related to a variety of social problems. The individual histories of

issues often have unique characteristics which cannot be accounted for by a generalized natural history model. Spector and Kitsuse (1977:14) point out that their natural history model is hypothetical: "We do not assert that the generic social problems processes are the empirically derived collective portrait of a large number of individual histories." Instead, their model suggests what researchers might attend to or might be used as a guide.

This analysis focused on important conditions existing before the emergence of the issue on television news which influenced 1) how the issue would be initially framed; and 2) who the key claims-makers would be. Television news coverage of the hazards of exploding aerosol spray cans, of deaths from inhalation of the propellants, and of the carcinogenic substances in the products prompted television news to frame the problem of ozone depletion as a consumer problem. This media frame became the central organizing idea (Gamson, 1988) for making sense of later events and for referencing the basic source of controversy on this issue.

Aerosol spray cans became the key symbol used by media to simplify an esoteric scientific problem. This focus prior to, and during, the emergence of the problem also influenced which official agencies became involved with the issue.

The CPSC and the FDA were involved early in the issue, establishing guidelines and calling for bans. The aerosol spray can industry responded, criticizing what they considered

to be overzealous agencies. These elements of the controversy, the identification of a specific cause of the problem, claims of harm by consumers, rebuttals by industry, and official agencies responding with policy, all created a thesis and antithesis context that would influence how television news portrayed the ozone depletion problem.

The first news segment dealing with ozone depletion reflected these pre-emergence activities. Walter Cronkite (CBS, 10/3/74) began: "Another pollution problem on the consumer level has got scientists concerned---" [emphasis added]. This brief introduction both framed the purported problem as a consumer issue and identified scientists as the claims makers. The problem was legitimized as scientists from highly prestigious research Universities and federal consumer agencies became the source of claims. These two specialized resources became routine sources of news, providing deadline-conscious reporters with usable materials (Nelkin, 1987; Friedman, 1981; Gans, 1979; Stallings, 1990).

The review of scientific research leading to the discovery of the ozone depletion theory suggests that the collective effort of scientists may be viewed as a claims-making activity (Aronson, 1984). Knowledge of ozone depletion emerged from social interaction among scientists. This social constructionist analysis gives evidence that scientific facts are socially constructed (Barnes, 1974; Bloor, 1976; Mulkay, 1979). Although the original claims of ozone depletion from

CFCs were speculative, they gained the status of "fact" as scientists collaborated and the issue was covered by television news and other media. As Gusfield (1981) found, "at each step in the process, from data to interpretation to transmission, a more factually authoritative world was made."

Spector and Kitsuse (1977) suggest that the development of social controversy marks the culmination of stage one in the natural history of social problems. However, social controversy existed during the emergence of the problem and presently continues. No evidence of a distinct second stage was found from this analysis. The constituency of scientists researching the problem and the lodging of claims broadened. Industry's counterattack became more forceful. Official agencies involved in the issue grew in number and became more specialized. Rather than providing solutions there was a tendency for agencies, committees, and commissions to avoid direct or immediate recommendations. The typical response was to call for more research and to pass the responsibility of policy recommendation to larger or more prestigious institutions, e.g. EPA, NAS.

A time period covering the years of 1979 to 1986 was characterized by a decrease in agency involvement and a lack of media attention. This occurred as the Reagan administration prompted deregulation of industry and effectively dismantled the EPA. Also, regulatory activity drastically slowed down after the aerosol spray can issue came

to an end. Because the issue had originally been framed as a consumer problem, a false sense of resolution of the problem existed.

This analysis reveals some evidence of a third stage as postulated by Spector and Kitsuse. This stage, they suggest, is characterized by the reemergence of claims and demands expressing dissatisfaction with official procedures for dealing with the imputed condition (p.142). Two groups of claims-makers, environmentalists and politicians, frequently appeared from 1987 to 1989. They expressed complaints against the EPA and the Reagan and Bush administration. Their criticism reflected a lack of trust in these institutions.

Environmentalists pointed to the EPA's delays in action, their continued call for further study, and industry's avoidance in complying with deadlines. Criticisms were made regarding the leniency of planned reductions of CFCs and greenhouse effect gases. Politicians criticized the Reagan Administration's reluctance to take initiative. The Bush Administration was criticized for its changed position on global warming during the Netherlands conference in 1989.

The changed focus from the national level to the global arena reflects characteristics of the fourth stage as conceptualized by Spector and Kitsuse. It became apparent that the U.S. regulatory agencies could not cope with the world-wide environmental problem. World-wide protocols and treaties have become the only meaningful approach to the

global issue of atmospheric deterioration.

The next chapter examines more closely individual claims-makers involved in this issue appearing on television news over the years. Special attention is given to major themes or strategies reflected by the comments of each claims-maker.

CHAPTER 5

THE CLAIMS-MAKERS

Introduction

The host of competing and conflicting interpretations by various claims-makers commenting on atmospheric deterioration, as presented by television evening news, suggests the subjective nature of the issue. Tracing how claims-makers justify their statements on television news over the years reflects the process by which problems of the atmosphere have been defined, how examples they use shape our sense of the problem, and how they promote certain orientations. Claims-makers appearing on evening news characterize the issue of atmospheric deterioration in particular ways, they emphasize some conceptions of the issue, focus on particular causes and advocate particular solutions. Often, these subjective orientations have little in common.

This chapter focuses on five key claims-makers that have appeared in atmospheric deterioration news segments: scientists, industry spokesmen, politicians, environmentalists, and citizens. Each claims-maker is identified by the news when they first appear in a segment by a "key" or caption noting their name and institution they are affiliated with. The above categories of claims-makers were determined by such keys. This analysis of claims-makers notes

when they first appear on television news, and the frequency of their appearances throughout the years.

Claims-makers define the issue by their rhetoric, but network editors, anchors, and journalists also use various claims-makers to interpret developments of the issue. This review of major claims-makers interviewed and referred to by evening news shows that each actor serves a particular role during news segments. A typical appearance by a claims-makers consists of a two or three-sentenced taped interview, cut and spliced together with other interviews. Thus news-workers have control over which claims-makers appear on the news, which statements are used, and the order of statements during a news segment.

Claims-makers appearing on news are motivated by self interest, projecting a certain image of themselves or the group they represent. As Dotto and Schiff (1978:5) point out, "Scientists would be accused of alarmism and publicity-seeking; industry of self-interest and deviousness; environmental groups and their 'fellow travelers' of overreaction and hysteria; politicians and government agencies of inaction or self-serving manipulation." These particular interests influenced the themes expressed by each claims-maker over time. Scientists wished to gain recognition, desired grants for further study, were concerned with establishing proof in order to predict with a degree of accuracy, and therefore establish certainty of their claims. Industrial

spokesmen were concerned with protecting their image and profits while maintaining favorable public relations. Politicians gained notoriety, using the opportunity of television appearance for public notice. Some of these considerations influenced themes developed by claims-makers appearing in the news. This chapter identifies typical themes expressed by claims-makers: how they define and redefine the issue, respond to opposition, change strategies, and interpret claims by others. According to Schneider and Kitsuse (1984, xiii), "The strict constructionist is interested in these questions in the context of challenges, counterclaims, and oppositions that may or may not arise." In focusing on major themes expressed by key claims-makers appearing on evening news, this chapter looks at how several claims-makers shape our perception of what the problem is. This social issue is constructed in various ways by each claims-maker. Best (1989) suggests that it is important to decipher how claims-makers typify social problems: "Typification occurs when claims-makers characterize a problem's nature" (p. xx). Through typification a social problem is given orientation, is viewed from a particular perspective, and emphasizes certain aspects of the problem.

Scientists and Television News of Atmospheric Deterioration

Introduction. There were three distinct phases that typified the style of rhetoric and explanation used by

scientists during the television news career of the issue of atmospheric deterioration. Each of these phases created a context in which reported events could be interpreted. During the first phase, when the possible problem of ozone destruction was first discovered, scientists' claims and predictions were guarded and their rhetoric was tenuous. Anchorpersons and reporters similarly reflected doubt regarding the scientific validity of assertions by researchers.

During this first phase, the issue was cast as part of an ongoing controversy in which scientists were portrayed as struggling to lay claim to an accurate assessment of the problem, taking great care to not present erroneous conclusions. A backdrop of uncertainty prevailed, and spokesmen making official statements were revealed as arbitrators presenting their evaluations as products of negotiations. This cautious approach especially typified reports of findings and recommendations by scientists affiliated with government agencies, particularly the National Academy of Sciences. The statements by independent scientists, however, were more emphatic, as they declared their forceful opinions and resolutely made their predictions.

The second phase occurred during a seven year period (1978-1985). Scientists appeared in newscasts covering this issue only a few times. The ban on aerosol spray cans and the events surrounding the implementation of the ban had waned.

Although research on the problem continued, no new or dramatic findings occurred. The issue lay dormant as no clear opponents had been identified. Near the end of this phase of the issue, in 1984, the NAS made an official reassessment, claiming their earlier estimations of ozone depletion had been too extreme.

A breakthrough in the issue and increased use of scientists in news reports occurred with the 1986 discovery of the ozone hole over the South and North Poles. In conjunction with this new development, the heat wave of 1988 spurred the use of scientists in news segments dealing with the greenhouse effect. Scientists appeared frequently, explaining their findings and making their predictions. The use of visuals increased; computerized pictures of the ozone holes became common, and scientists were shown leaving for research expeditions. The rhetoric of scientists became more extreme as their claims were less cautious and their predictions were more pessimistic. Television news presented the issue as a succession of remarkable disclosures, the result of arcane activities by stars of science.

The Ozone Depletion Issue. Although appearances were sporadic in the middle years of the television career of the issue, scientists were one of the most common claims-makers on television news coverage of the two issues, ozone depletion and greenhouse effect. The first interview with a scientist

was on October 3, 1974, eight months after the first news segment covering the aerosol spray can facet of the issue. This October 3 segment explained, for the first time on a television newscast, what chlorofluorocarbons were, what types of products contained the chemical, and how the accumulation of gases in the upper atmosphere depleted ozone. CBS reporter, David Calhain, also alluded to published research by scientists from the Universities of Michigan and California, and Harvard. These scientific findings explained how the gas was broken down, liberated chlorine atoms, and activated a chemical reaction destroying ozone molecules. Dr. McLeroy, of Harvard University, explained the long range nature of the problem:

We are talking about a change in the ozone which might occur on a time scale of ten years, and the biology can respond to such a change, but only if it has several thousand years to do so.

During this early stage of the scientific process of discovery, television news reflected existing doubt regarding the claims of researchers. During the October 3, 1974 news segment, the CBS reporter pointed out that scientists did not have "concrete evidence about the actual condition of the ozone layer." At this point, the issue existed as a result of three published journal articles, discussions at several scientific conferences, and some mild disclaimers by the billion dollar a year fluorocarbon industry. Anticipating the

difficulty that awaited scientists in establishing "proof," McLeroy added, "We can not afford to wait to have a theory substantiated by having a major effect in the ozone actually occur." McLeroy's statement seemed to anticipate eventual difficulties that were to arise as scientific claims would unfold within a social context in the years to come.

Establishing what constitutes scientific proof was a feature of the issue that led to various interpretations by the myriad of claims-makers involved. Russel Peterson, the head of the Council on Environmental Quality, for instance, stated: "I believe that we cannot afford to give chemicals the same constitutional rights that we enjoy under the law. Chemicals are not innocent until proven guilty" (Dotto and Schiff, 1978). The dilemma involved coping with environmental effects that could not be predicted with certainty.

Seven months later, the NAS, after studying the problem for one and a half years, called for warning labels on aerosol spray cans and a possible ban in two years. The cautious nature of the academy's actions was evident by a news segment on June 12, 1975. The rhetoric of the commissioner of the NAS was depicted by evening news as restrained, often tempering any claim with indeterminate statements. In noting the consequences of increased ultraviolet light, he referred to possible harm to plants and animals of unknown magnitude. The commissioner was also shown pronouncing what some scientists maintained would be a warming at the earth's poles. He

concluded, "No one knows what that will mean."

Later that year, during an October, 1975 news segment, the contrast in rhetorical styles between independent scientists and spokesmen for governmental organizations studying the atmospheric problem was made explicit by CBS reporter, Robert Shakney. He pointed out that a federal task force conceded that more research was needed before a ban could be recommended. "But," Shakney stated, "independent scientists warn that waiting would be dangerous." The following dialogue between Dr. McLeroy and Robert Shakney was shown as McLeroy, speaking as an independent scientist, pointedly assessed the gravity of the situation.

Dr. McLeroy: I think our lives would be seriously endangered if the reduction of ozone was as large as twenty percent. I think it would be catastrophically serious for the environment as a whole. According to model calculations, with an unregulated industry growing at a rate at which it did in the 1960s by twenty percent per year, that would occur by the turn of the century.

Shakney: By the year 2000, if we don't do anything, then our lives could be endangered?

McLeroy: I think it would be serious much earlier than that, but it would be catastrophic by the turn of the century (6/12/75, CBS).

Three months later, the National Academy of Sciences began a massive research project to study the possible problem. Roy Neal, an NBC reporter, alluded to the temperate mode that characterized scientists affiliated with the

government when he stated, "Government scientists say that despite the massive effort it will take a long time to come up with hard information." During the same news segment, the co-chairman of the government task force, Dr. Warren Muir, suspected that the available preliminary data suggested that the NAS research would also find fluorocarbons depleting the ozone layer.

One year later, the long awaited results of the NAS study, or as NBC anchorman David Brinkley referred to it, the "more or less final word," were made public. Although the NAS believed fluorocarbons would eventually be banned, it recommended a couple more years wait for more research. On September 13, 1976, Dr. John Tukey, the chairman of the NAS ozone committee, was shown reading a prepared statement at a press conference, listing the expected consequences of increased ultraviolet radiation. The compromise was influenced by the expected cost of implementing policy and a future plan to reduce the number of anticipated deaths.

On CBS the same evening, a clip of Tukey rationalizing the delay in regulation was shown. He maintained that the cost of delay would not involve more than a fraction of a percent in ozone depletion. Existing measurement programs, he assured the audience, "promise to reduce our uncertainties quite considerably in the near future." The chief message by the NAS continued to be the lack of certainty in research and the paucity of scientific proof.

The Departure of Scientists from Newscasts. During the next five years scientists did not appear on television news segments that covered atmospheric deterioration. During 1977, most of the news segments dealt with the implementation of the ban on aerosol spray cans. Only one segment appeared on the issue in 1978, only one in 1979, and none in 1980. While research continued, no dramatic evidence had been revealed. The specific issue of aerosol spray cans had been resolved. And no other culprit had been clearly identified as an actor in the issue. Without two opposing opponents, no real issue existed.

On August 13, 1981, NBC covered ongoing NASA research. This atmospheric research was producing satellite pictures of the ozone layer. The findings were referred to as "preliminary" by NASA director, Donald Heath. He insisted more satellite measurements were needed to "prove" the ozone depletion theory. A film of computerized pictures of the ozone layer, produced by an ozone mapping spectrometer, was shown. However, since the claims by the scientists were guarded, and the findings were defined as preliminary, no special emphasis was made about the pictures by the anchorperson, Roger Mudd, or NBC reporter Andrea Mitchel.

During the last clip of this same news segment (August 13, 1981), Andrea Mitchel stated, "The Carter administration wanted to set limits on chlorofluorocarbon production, but the Reagan administration has told congress it sees no reason for

any other controls." The Reagan Administration had not been identified as an actor or adversary opposing scientists prior to this. Few government task forces or committees were actively pursuing the issue, seemingly because there was an absence of solid scientific proof. While the aerosol spray can manufacturers had been dealt a blow with the ban, the giant industry involved with air conditioning and refrigeration had not been pressed to create a replacement for fluorocarbons. The issue was still lying dormant.

Three years later on February 22, 1984, both ABC and CBS carried a brief news segment which mentioned a NAS reassessment of the ozone depletion warning. The ABC news segment conveyed the new NAS position, this position being that the earlier warning was too strong. A quote from the NAS study was presented as illustration: "We do not have an imminent crises on our hands." Paraphrasing the NAS reassessment, Dan Rather stated, "the long-held worry that aerosol spray is ruining the protective ozone layer, while not a bunch of hot air, is not nearly the problem it was once thought to be." This refutation occurred at the end of the phase during which scientists were absent.

Although television news coverage of this issue during this seven year period was meager, there were important scientific developments taking place. A 40 percent decline of ozone in the Antarctica was first recognized from measurements in the spring of 1984 and reported in the British journal

Nature (Farman, Gardiner, and Shanklin, 1985). The first compilation of global mean temperature was developed, giving estimates spanning the period 1861-1984 (Folland et al., 1984). New methods were developed and new estimates calculated for global mean temperature (Jones, Raper, and Wigley, 1986).

The rediscovery of the ozone depletion issue, appearing about a decade after the aerosol spray can ban, underscored the negligence of television news. Having focused on the ban and the events leading to it, the news failed to investigate the continuing widespread use of CFCs. Nelkin (1987) points out that this negligence was emblematic of the superficial coverage of the ozone depletion issue. Television news was faced with complex technical information and conflicting expertise. The response by the news was providing stock framing, such as the balancing of contradictory claims, identification of vested interests, and the probing of regulatory agency credibility.

The media's search for the eye-catching, audience-appealing, news-worthy story encouraged television news to trivialize the issue. Todd Gitlin (1980) suggests that such selective reporting marginalizes issues by focusing on sensational developments while ignoring the more enduring and substantive aspects of controversies. When the sudden glare of the media spotlight was finished with the aerosol spray can controversy, television news-workers found the issue less

appealing.

The Breakthrough. The most significant scientific breakthrough was covered by television news on August 15, 1986, when a group of scientists presented new evidence of a hole in the ozone layer over the Antarctic. In the longest news segment covering atmospheric deterioration (five minutes and ten seconds), Dan Rather reported that a research team had left Los Angeles to study "a mysterious massive hole high above the ice" in the atmosphere over the South Pole. Enhanced satellite photos showing a series of colored splotches over the South Pole served to dramatize the event. Susan Solomon, from the Ocean and Atmospheric Administration and leader of the expedition, used suspenseful rhetoric in describing the finding. She stated, "Nobody predicted this. It is like a bomb falling out of the sky." Crofton Farmer, of the Jet Propulsion Laboratory gave emphasis to the finding by saying, "It's a huge change. It is unprecedented." After reviewing the possible grave consequences, reporter David Dow posed the question, "Beyond all that, the question is why? Why is it happening?"

Now the claims of researchers, previously presented through logical explanations and obscure scientific language, had been instantly transformed into an observable, measurable phenomenon. The undulating, computer enhanced, colored pictures were excellent for the medium of television. After

an animation of the sun, earth, and radiating ultraviolet rays beaming down on the earth was shown, F. Sherry Rowland, originator of the ozone depletion theory, made a dismal pronouncement saying, "We expect things to get worse before they get better, even if you were to stop completely the release of chlorofluorocarbons to the atmosphere." The image of the computer-enhanced pictures of the ozone hole would be used by television evening news during the next three years (1986-1989).

More results of the expedition were presented by the researchers before a House subcommittee. NBC showed footage of the hearings on March 9, 1987. Film of the research site in Antarctica, animation of CFCs rising in the atmosphere destroying the ozone layer, and satellite imagery augmented the clips of testimony by Susan Solomon. Reviewing the major findings, Solomon said, "We observed a thirty five percent decrease in the ozone overhead, three different and independent observations showed this change." Her review accented the careful attention given to the research process during the expedition.

Not only did the researchers find a decrease in ozone, Solomon informed the committee, but in its place they found chlorine dioxide compound, the residue from chlorofluorocarbons freed after ultraviolet light breaks down the manmade gas. Dr. Solomon predicted that there would be an eventual "large-scale depletion of the ozone layer at other

latitudes."

The momentum generated from the discovery and analysis of the hole in the ozone over the Antarctic continued, and the rhetoric by anchormen, reporters, and scientists became more intense. Speculations of future possibilities became more severe. During opening comments of a April 15, 1987 news segment, Tom Brokaw pointed out that "serious threats to our atmosphere are no longer theoretical. They can be actually measured." The discovery of ozone depletion above Antarctica also spurred concern about the greenhouse effect, as the two issues were merged together during evening news.

Rowland, made an association between atmospheric deterioration and nuclear war when he said, "I think the changing of the atmosphere is the most important problem we have for our future other than the possibility of nuclear war." It was the interconnection between the causes and consequences of the greenhouse effect and ozone depletion that was the focus of the news segment (April 15, 1987). Dr. David Rind of NASA warned that the immense warming would be "far more rapid than civilized man has had to put up with." Rowland indicated the Antarctic ozone hole was "totally unpredicted." This long news segment (four minutes forty seconds) had an unusually large number of visuals. It was composed of forty four different film footages, two animations, a satellite picture, and a backdrop still.

Coverage of the issue from that point became more in

depth, including explanation of another chemical associated with both ozone depletion and the greenhouse effect. On March 4, 1988, the contribution of methane gas to both atmospheric problems was reviewed. Dan Rather referred to a NASA study in the journal, Science, that confirmed the damaging effects of methane. Footage of Rowland was shown commenting on the accelerating amounts of methane in the atmosphere. CBS reporter Terry Brinkwater explained the damaging effect of methane on the ozone layer. Donald Blake, an atmospheric chemist, pointed out that increases of methane in the atmosphere were adding to the greenhouse effect. Another clip of Rowland accented the correlation of methane with higher temperatures and shifts in oceanic currents. The problem of ozone depletion and the greenhouse effect were presented as related and accelerating, and capable of creating world-wide climate changes.

Increased Evidence and Escalation in Coverage of the Issue. News segments of atmospheric deterioration were getting longer and more in depth. Scientists and reporters were using fervent rhetoric, often supplemented with metaphors and vivid imagery. During a March 15, 1988 news segment announcing the newly found ozone hole over the North Pole, reporter Battrina Gregory paraphrased the words of scientists in referring to the 2.3 percent drop in ozone since 1969 as "Better evidence than a smoking gun." National Center

for Atmospheric Research spokesman, John Gile, figuratively stated:

I think what this report does for the first time, is here are the corpse. We are actually seeing ozone decrease in a very credible and verifiable way.

Three months after discovery of the ozone hole over the North Pole the issue of atmospheric deterioration received yet another boost in coverage in the form of a heat wave that gripped the nation. On the first day of summer, June 21, 1988, CBS used comments by climatologists and a climate researcher from NASA to underscore the significance of the heat wave. John Topping of the Climate Institute predicted that the trend of increased heat would continue "given what man has done to tamper with the atmosphere." Climatologist Stephen Schneider insisted that there was no question whether it would continue to warm, "but will it warm at such a pace that it will overwhelm our ability to respond?" And David Rind, a NASA climate researcher was shown in front of a computerized picture representing warming in the United States. He used a simile in describing the findings as he stated, "We have made projections out to the year 2060, and the temperature changes one gets at that point read like science fiction." Dan Rather solidified the connection between the heat wave and the greenhouse effect by insisting that the heat wave was much more than mere talk of the

weather, but was the topic of "serious scientific speculation."

During a June 23, 1988 news segment on NBC, James Hansen of NASA, predicted 1988 would be the warmest year on record. Hansen, shown speaking before a Senate committee, said evidence presented a very strong case for a changing climate. George Woodwell, of the Woods Hole Research Center, continued the use of strong metaphorical rhetoric when he appraised the situation, saying, "The problems unaddressed has the potential of turning the world into a form of chaos not greatly different from global war."

The consequences of global warming were also being attributed to problems that had previously been accounted for by other causes. CBS continued the intense coverage of the heat wave on June 26, 1988, turning to Naturalist Garret Smathers, who explained that the die-back of fir trees in the Blue Ridge Mountains, North Carolina, that he had previously ascribed to acid rain, now seemed to be the result of the greenhouse effect.

The scientists' assessment of the consequences of the greenhouse effect were now consistently pessimistic. Climatologist Thomas Karl predicted that in terms of the developing greenhouse effect, "it's unlikely we will see a reverse. We might be able to curb the increase." Possible remedies of the problem were mentioned, including massive reductions in the use of fossil fuel. But as Dr. Rind

predicted, such drastic remedies would also have to include a new source of energy on a global level. However, he maintained that "It is unlikely, from my point of view, that [alternative energy sources] will be an option taken by civilization." Scientists' assessment of the consequences of atmospheric deterioration were becoming more bleak.

The search for other energy sources included the suggestion that the United States should greatly step up its spending for nuclear power. A CBS news segment on August 10, 1988, paraphrased physicist Edward Teller's remarks at a conference in Washington. He maintained that this suggestion was offered partly because of the greenhouse effect.

Later that month, Dan Rather quoted from an article in the Journal of Geophysical Research Atmospheres. The article suggested warming of the earth "appears to be inevitable even if there are sharp cutbacks in the use of greenhouse effect chemicals." Another bit of information given during this brief news segment on August 30, 1988, might not have been considered newsworthy if general concern over the greenhouse effect had not escalated to such a pitch. This involved the report by a government agency finding global concentrations of carbon dioxide had increased twenty five percent since the middle of the 1800s. For the past couple of years (1987-1988) television news had portrayed scientists as definite in their statements, as experts pointing with conviction to causes and consequences of atmospheric deterioration, while

suggesting extreme measures to remedy a problem that seemed destined to produce destruction. Unlike their previous conservative image, scientist had been shown interpreting research data with a great amount of assurance, seldom qualifying their conclusions or tempering their projections of possible scenarios that could unfold regarding the fate of the globe. This new image of scientists projected by television evening news had changed from the earlier depiction when the consequences remained unseen and research findings were presented as speculative.

Dramatic new evidence of the hole in the ozone over the North Pole was reviewed during a January 13, 1989 news segment. A six week long, international NASA research project based in Stavanger, Norway uncovered the new data. Film footage of the modified U2 research plane taking off and landing, along with clips of scientists unloading the instruments was shown. Earlier news reports had disclosed findings weeks after a research project had been completed, or as scientists testified to committees in Washington. This approach was changing, as NBC science reporter, Robert Bazell, stated, "Although the project is not complete, the scientists already have some evidence that manmade chemicals are destroying the ozone over the Arctic" (1/13/89, NBC). Dr. Brian Toon, of NASA explained the ramifications of the existence of a hole in the Northern Hemisphere, more densely populated than the Southern Hemisphere.

A brief review of the findings and their implications were reported by ABC on February 15 and 17, 1989. Film of computerized pictures of the atmosphere were shown as Ted Koppel pointed to the various colored, undulating images. One unspecified scientist was quoted as saying, "The atmosphere is prime for the destruction of the ozone layer." One tendency of television evening news was to connect the issue of atmospheric deterioration with other issues or dramatic, unforeseen events. Space exploration had suffered setbacks during the 1970s and 1980s, sometimes criticized as not being justifiable. Now scientists turned to planetary exploration to find answers to the greenhouse effect. Pictures taken by astronauts during shuttle missions had been used to study the global environment, often revealing what CBS reporter, Bruce Hall, described as "a fragile changing environmental system." But NASA was focusing on deep space in order to understand how other planets in the solar system operated. Scientist's attention turned to Venus, where temperatures reach nine hundred degrees as a result of a "runaway greenhouse effect."

During an April 27, 1989 news segment on CBS, John Pike, of the Federation of American Scientists stated, "Understanding how that [runaway greenhouse effect] developed on Venus might help us understand how it developed here on earth." Plans for further space study were mentioned. These included the Galileo space craft, intended to explore the gaseous clouds that cover Jupiter, and the Hubble telescope,

launched to explore deep space.

The final atmospheric deterioration news segment appearance of scientists in 1989 occurred on September 19. CBS combined coverage of hurricane Hugo with the greenhouse effect. Dan Rather reported that some experts were predicting that hurricanes would become more intense as a result of global warming. Climatologist Kerry Emanuel speculated that as the greenhouse effect takes effect the tropical ocean temperatures would rise by a few degrees, and possibly drive the winds of a super hurricane to 240 miles an hour. Dr. Michael McLeroy suggested changes in policy as a result of this possibility. Finally, Robert Leviegy, of the National Meteorological Center, questioned the ocean heating scenario, pointing to other factors that could come into play.

Conclusion. Scientific discoveries that have relevance to social controversies are reported on television news, but theories are seldom considered newsworthy. Writing about how the press covers science, Nelkin (1987) observes that, "Science appears in the coverage of dramatic crises, major discoveries, and the feats of science stars." The postulated discovery of ozone deterioration, though considered newsworthy by television, was first received with skepticism, characterized by cautious rhetoric and guarded claims. The conservative nature of science seemed to mark the manner by which scientists framed their statements and reporters

reviewed scientific explanations.

Although research into the problem continued from 1978 to 1985, there was little news coverage during this period. The actual nature of the research process, the piecemeal accumulation of evidence that serves as the basis for discoveries or new insights was not considered newsworthy though research was continuing during this time period. Most news segments dealing with atmospheric deterioration were typically highlighted by imagery that appealed to an audience in need of a kaleidoscope of impressions. During the "dark ages" of the issue, however, few developments qualified as exciting newsworthy events.

The major discovery of ozone holes over both the South and North Pole, however, freed scientists from the self-imposed restrictions of a cautious creed of scientific neutrality. Scientists were also portrayed as adventurers, leading expeditions to far reaches of the earth, attempting to shed light on a problem that could eventually lead to the end of civilization. Television news portrayed scientists as creators of exciting new breakthroughs. This would hold the interest of a captive audience. The dramatic crises of the heat wave of 1988 also connected the arcane issue of the greenhouse effect to a concrete situation affecting the lives of most Americans.

Industry and Atmospheric Pollution on Television Evening News

Introduction. Television national evening news has captured the varying postures of industry over the past fifteen years regarding the ozone depletion issue. As regulatory agencies have acted, calling for studies and imposing limitations on fluorocarbon use, as scientific evidence has accumulated and the ozone depletion theory has gained validity, the ozone depletion issue has changed. Subsequently, industry has had to alter its strategies regarding its public relations in reaction to this transition of the issue.

There have been seventeen ozone depletion news segments involving interviews with industry spokesmen. The first interview with an industry spokesmen occurred in 1974 when the aerosol spray can issue began. During the early era of the issue, spanning approximately three years (1974-1977), industry initially appeared diplomatic and concerned about possible harm from fluorocarbons. Interviews with spokesmen reflected this. As regulation was slowly imposed, industry became defensive and maintained that the ozone depletion theory lacked scientific support. Finally, as sales of aerosol sprays decreased, industry staged a counter-attack by offering their own research. Their findings indicated less ozone depletion than previous studies had found.

Later, during the mid 1980s, the second phase of the

fluorocarbon issue emerged. The possibility of restricting other uses of the gas such as air conditioning and refrigeration, provoked a different set of industrial strategies. One successful tactic was a delaying ploy. This involved industry spokesmen pleading for time to research and develop alternative forms and designs of coolants for products that used fluorocarbons. As pressure mounted, industry spokesmen appearing on television news broadcasts appealed to the self interest of consumers, pointing to the increased cost and impending sacrifices in life style that would inevitably accompany an out-right ban on fluorocarbons. Finally, some, but not all, industry spokesmen on national evening news suggested that it was more prudent for industry as a whole to recognize the need to move away from the use of fluorocarbons entirely.

The Aerosol Spray Can Era (1974-1977). There were three distinguishable themes which developed on television news coverage of industry during the aerosol spray can era of the issue: the pervasive use of fluorocarbons, the economic magnitude of the industry, and the lack of sufficient scientific evidence supporting the fluorocarbon/ozone depletion theory. First, the extensive use of fluorocarbons was documented by the television evening news in such a fashion that it made it apparent to the general public that limiting fluorocarbon use would involve a great amount of

change and sacrifice by industry and consumers. Second, industry faced a billion dollar a year sacrifice via the loss of a business that had been growing since the development of fluorocarbons in the 1930s. Finally, the theme of the tenuous nature of scientific evidence supporting the ozone depletion theory served as the basis for industry's stance against banning or limiting the production of fluorocarbons. These three themes are developed below as the news segments are discussed.

The widespread use of fluorocarbons was documented by ABC reporter David Calhain as he listed the type of products that use the gas as a propellant:

It started out with insecticide, then hair spray, then deodorants. And now the list is endless. Medical aides like disinfectants and ointments, food stuffs like whipped cream and cheese. Cleaning supplies, soaps, and air fresheners, furniture polish and more. Fire extinguishers and auto supplies, spray paint, even dog repellent (CBS, 10/3/74).

In 1974, fluorocarbons were also used in refrigeraters and air conditioners, but in line with most segments during the 1970s, this first segment focused on the more common products with which the viewing audience could identify. Calhain captured what, at the time, seemed to be the irony of scientists' pessimistic claim of ozone devastation as he summarized the problem while spraying an aerosol can, saying, "In other words, this seemingly innocent gadget could be the source of

serious danger for the whole world." The message communicated from the media was that this was an esoteric claim being postulated by a few scientists, one that had long-term, worldwide implications. In a more practical sense, the ozone depletion claim had significance in terms of profits for the multi-billion dollar industry that produced the product.

At the time, the production rate of CFCs had been rapidly growing. Before 1973, the U.S. rate of production had been doubling every seven years. By 1973, 7.6 million metric tons of CFCs had been produced since the gas was invented in the 1930s. In his closing remarks of the October 3, 1974 news segment, Walter Cronkite pointed out that while the spray from a single can does not seem like much, "there were three billion such cans turned out last year containing some four hundred million pounds of those fluorocarbons." Although CFCs were used on a large scale in air conditioning and refrigeration, the focus remained on the aerosol spray can and the manufacturing of the cans.

The fluorocarbon and aerosol spray can industry had much to fight for. There were less than 5 million cans sold each year during the late 1940s. Five hundred percent increase in sales occurred between 1950 and the early 1970s. Sales peaked in 1973 to about 2.9 billion spray cans just before the ozone controversy surfaced. By 1973 close to half of all fluorocarbons produced were used for spray cans (Dotto and Schiff, 1978).

In addition, there were many different kinds of companies other than spray can companies that would be effected. There were six fluorocarbon manufacturers in the U.S. DuPont, the largest, produced half of the fluorocarbons in the U.S. Other companies supplied components such as valves, caps and cans. Finally, some companies specialized in filling the cans with fluorocarbons, the substance in the can and shipped the package back to the producer. However, television news almost exclusively used spokesmen from DuPont for comments and focused on DuPont industries in film footage during news segments.

Also, there were the trade magazines that documented the spray can controversy from an industry's point of view. Three in particular denounced those who attacked spray cans: Aerosol Age, Drug and Cosmetic Industry, and Soap/Cosmetics/Chemical Specialties. Editorials in each of these trade journals criticized media's creation of propaganda, production of phobia, and construction of fear toward a safe product.

However, national news' portrayal of industry's initial posture regarding scientific evidence of the issue was different. ABC's Calhain pointed out that industry had not disputed the theory offered by scientists, and that industry had agreed that immediate research was needed on fluorocarbons and any other chemical possibly harming the ozone layer. This initial depiction by national news of a concerned and diplomatic industry occurred as manufacturers attempted to

appraise the new situation.

Dr. Raymond McCarthy of DuPont, a spokesman for the company who would appear on television news often over the years, reflected a similar posture. He maintained that DuPont would act "in the public interest" if research indicated that fluorocarbons were causing environmental problems. The research division of DuPont, he pointed out, invented new compounds, and the division would invent other compounds just as they had invented fluorocarbons if they had to. McCarthy appeared carefree while talking and seemed to downplay the significance of a possible environmental problem.

Although the initial approach of industry appeared diplomatic during early news segments, statements by industry spokesmen at trade conferences and in trade journals were more abrasive and adversarial. One month after the above statements by Raymond McCarthy, an assault against scientific claims of ozone depletion was made during a meeting of the Chemical Specialties Manufacturers Association (CSMA) of DuPont. McCarthy quoted from an article by Landon and Kelly of the University of Colorado in the May issue of Nature, claiming "a net increase of seven percent in ozone layer in the 13 year period of 1957-1970." Fluorocarbon production was at its peak during this period (McCarthy, 1974).

Six months later, the tone of industry's response to a task force recommendation calling for the labeling of aerosol spray cans was much different. The task force, composed of

fourteen government agencies, had completed a four month study and concluded that legitimate cause for concern existed regarding a fluorocarbon threat to the ozone layer and a resulting increase in skin cancer. On June 12, 1975, all three networks used the same quote from Frank Bower of DuPont as he responded to the recommendation.

We believe that this approach to regulation that was described today is premature and entirely wrong. It has the potential of destroying a perfectly good and useful product without a basis in scientific fact.

Throughout this era, industry was not characterized by television news as a unified front. For instance, NBC interviewed the president of the Ridsen Manufacturing Company, producers of aerosol spray cans actively working to develop alternative forms of spray. Films of the company's gas-free manual pump and sprays propelled by carbon dioxide were shown in the segment while Chris Bukley, president of Ridsen, explained that there was a "way to get around the use of Freon--." Bukley also admitted that the Ridsen company accepted the fact that fluorocarbons may have been damaging the ozone layer. However, the economic impact upon industry was highlighted by CBS reporter, Robert Shakney, as he pointed out that fluorocarbon production was an eight billion dollar a year business for DuPont, involving two thousand jobs. About one half of the aerosol products on the market in 1975

used fluorocarbon gases as propellants. Realizing that an imposed warning label would hurt the sales of aerosol sprays, industry representatives maintained that the case against fluorocarbons had not yet been scientifically proven.

The task force had opted for the recommendation of warning labels but decided to wait for a National Academy of Science study before approving an out-right ban on aerosol spray cans. The state of Oregon, however, had decided not to wait and had become the first state to pass anti-aerosol legislation. Oregon's aerosol spray industry immediately pointed to the harm the bill would do to the state's economy: a yearly fifty million dollars in spray can sales were expected to dry up. CBS interviewed Otto Wilson, a member of Oregon's Retail Council. He maintained that the state ban would have a severe economic impact. He also contended dogmatically, that the procedure of making decisions, which could have major economic impacts, was "being irresponsible" when such decisions were made without a firm factual basis.

Within the span of only nine months, industry's reaction (or at least its public relations image as reflected in the evening news), appeared to change. At first industry had a concerned and diplomatic air, but turned defensive as the first form of regulatory restriction was enacted. In September, 1975, an NBC news segment revealed another strategy adopted by industry that would prove to be the most successful over the years. This involved delaying and pleading for more

time. Time, industry argued, was needed to test the validity of the problem. Dr. Roy McCarthy, the director of research for DuPont, stated that it was industry's position that time should be taken to get the research results, "which I think seems to be in the neighborhood of three years."

One other problem requiring time to solve, industry representatives claimed, was finding an adequate substitute for fluorocarbons. It would take years of research to develop alternatives, to test their effectiveness, and to implement new products.

Criticism of scientists' claims and media coverage of the issue continued in 1975 by industry spokesmen during manufactures' meetings and in trade journals. Industry spokesmen maintained that the scientists making the claims are "all good friends" who are posing conclusions "based upon literally hundreds of assumptions and hypotheses" (Johnsen, 1975:84). The ozone theory was termed "utter nonsense" by Dr. Scorer, a British atmospheric scientist and former editor of the International Journal of Air Pollution. Scorer maintained that "chlorine is a common element in the environment and one which nature has handled in the past and can handle in the future." McCarthy insisted "there is no experimental evidence supporting the chlorine-ozone theory--and chlorofluorocarbons constitute a relatively small potential source of chlorine" (McCarthy, 1975).

A surprising supporter of Rowland was Donald Davis, a

writer for Drug and Cosmetic Industry magazine. Although the CFC trade journal Aerosol Age consistently took issue with Rowland and his supporters, Donald Davis described Rowland as an excellent speaker who shows "a clear superiority of skills over his opponent from industry, over trade association officials and over those in the scientific fraternity who are not yet convinced." Although he had written articles for the trade magazines for many years he was critical of industry's handling of the ozone problem and the trade magazines use of "overly reassuring words."

Near the end of 1975, CBS news reported that sales of aerosol spray products were down twenty six percent for the year. Consumer concern of possible harm to the ozone layer from fluorocarbons was the explanation offered. Only twelve days later, Walter Cronkite stated, "The fluorocarbon industry went on the counter attack---." A fluorocarbon research project, conducted by industry, indicated that "the potential effect on the atmosphere is only twenty five percent as much as that calculated earlier." Dr. F. Sherwood Rowland, who created the ozone depletion theory, referred to this claim as a false statement, and maintained that calculations of fluorocarbon damage were the same as they were a year ago.

In September, 1976, the National Academy of Sciences' (NAS) long awaited report confirmed earlier findings that fluorocarbons did indeed harm the ozone layer and believed that the chemical would eventually have to be banned. The

academy suggested to the White House, however, that more study of the problem was needed before fluorocarbons were banned or regulated. During a NBC news segment airing on September 13, reporter Sam Wicker pointed out that industry was pleased with the panel's recommendation that the situation be studied for up to two additional years. CBS also covered the academy's report the same evening. In his opening statements, Walter Cronkite noted that DuPont was the largest producer of fluorocarbons and that the company "praised the call for delay in regulatory action."

Industry's tactic of pleading for time had been adopted by the National Academy of Science's specially formed Ozone Committee. The element of scientific uncertainty was the one characteristic of the ozone depletion issue that could be exploited by industry. Industry maintained that the "public health dangers of fluorocarbon propellants have not been conclusively proved." Meanwhile, scientists claimed that they needed more time to assess the extent of environmental risk involved with the problem.

In the span of two years (1975-1976) industry had changed its posture toward the ozone depletion issue several times. The original theory of ozone depletion presented by scientists, in itself, was somewhat innocuous. Therefore, the theory did not present any concrete threat to the fluorocarbon industry, and the image presented by national television evening news accented industry's concern and diplomacy. When

regulatory agencies recommended warning labels, industry became defensive and insisted that their product was "perfectly good and useful." Industry's "counter attack" was formed as the threat became more concrete, and as sales of aerosol spray cans diminished. In Dotto and Schiff's book, The Ozone War, it was pointed out that annual spray can sales had fallen from 2.9 billion in 1973 to less than 2.3 billion at the end of 1976.

On November 23, 1977, CBS reported industry's response to the FDA recommendation for aerosol spray can warning labels. The recommendation for warning labels was intended as a step toward ending the use of fluorocarbon gas in spray cans. This move was not unanticipated by industry. Although an industry spokesman was said to be "surprised at FDA's haste in regulating aerosols," he also pointed out that industry recognized the current climate and was "scurrying around looking for alternatives."

Four months later CBS aired a segment concerning the state ban on aerosol cans by Oregon. CBS reporter, Sharon Lovejoy, indicated manufacturers' contention that there was "confusion within the scientific community on the dangers of using aerosol cans." However, a DuPont spokesman, Edward Lorenz, admitted that his company was not perturbed since the state ban was not unexpected. Although Lorenz indicated that management was disturbed; it felt that the law was premature. It was apparent that industry had anticipated the ban.

The Second Phase. Industry disappeared from national television evening news coverage of the ozone depletion issue for nine years, not reappearing until 1986. The last segment during the aerosol spray can phase of the issue was an ABC report, April 26, 1977. During this segment, the second phase of the plan was introduced. This phase dealt with other uses of fluorocarbons such as air conditioning and refrigeration. ABC's reporter pointed out that this "second part of the ban is far more alarming to industry." Changing the design of aerosol spray cans was a problem for industry, but changing the manner by which refrigeration and air conditioning operated would involve much more research and alterations in design. This phase would also prove to be more difficult for the EPA to regulate, once the regulatory agency became involved in 1977.

With the advent of the second phase of fluorocarbon regulation came another strategy by industry--appealing to the public. The fluorocarbon industry had learned that public reaction could not only influence the decision-making of regulatory agencies, but could also directly affect the sales of products. The practical consequences of a ban on uses of fluorocarbons, other than aerosol spray cans, was the focus of an interview with the president of the Air Conditioning and Refrigerator Institute during an April, 1977, segment.

People will have to live without refrigeration and frozen foods. But the impact on our life styles will be tremendous. And I don't think people will be willing to give up the standard of living they have now.

The fluorocarbon industry had now turned to the American consumer. The ban on aerosol spray cans had been a problem affecting primarily the aerosol industry, but restrictions on fluorocarbons in air conditioning and refrigeration represented a threat to the public. The reporter for ABC captured the dilemma facing the EPA at this juncture of the issue by saying in closing, "If industry can't develop replacements, any ban would have to be weakened to avoid sweeping changes in the American life style" (April, 1977). The reporter was looking to the future, aware that the next stage of fluorocarbon limitation would entail greater changes for both industry and the public than did regulation of aerosol spray cans. The CFC industry was relieved in 1981 when Anne Burford was nominated by President Reagan to head the EPA. During her confirmation hearings she testified that she believed the CFC issue was controversial and there was a "need for additional scientific data before the international community would be willing to accept it as a bases for additional government action" (Roan, 1989). Burford referred to the ozone depletion issue as a scare tactic in her book, Are You Tough Enough? (1986).

The Reagan administration continued its contention during

the early 1980s that CFC regulations could cause grave economic hardships. Substitutes for CFCs had not been developed. Several news segments reported reassessments by the NAS that earlier warnings of ozone depletion had been too extreme. Paul Harbor, DuPont's Environmental Manager in the Freon Division, claimed that "A number of scientific developments in 1980 sharply throw into question the utility of the NAS reports and EPA's ongoing reliance on them" (Roan, 1989:109).

In the next news segment involving an industry spokesman, occurring nine years later, the consumer was again focused upon. During the CBS segment airing August 15, 1986, reporter Jayne Quinn pointed out that although most Americans thought the ozone problem had been solved years ago with the banning of aerosol spray cans, the use of fluorocarbons had increased over the years. The official position held by many companies, she claimed, was that fluorocarbons were safe if used correctly, but this contention seemed dated and less palatable in 1986 than it did in 1977.

This passe' posture could produce negative consequences for the fluorocarbon industry, suggested business ethicist James Kuhn in an interview with Quinn. Referring to the fluorocarbon industry and what seemed to be its lack of sensitivity to the state of public opinion regarding the ozone issue, he stated:

They are playing with sociological and political dynamite here. If people believe that companies are not being concerned about our future, our children, then I think the backlash may be very severe indeed (CBS, August, 1986).

Industry's retort followed the same strategy etched out at the beginning of the second phase of regulation. In the next interview of the August, 1986 news segment, an industry spokesman, Richard Barnett, countered with an appeal to the self interest of consumers when he stated, "If, in fact, there is no need to change, what you are doing is penalizing the consumer with a higher priced product, maybe unnecessarily." It appeared that industry was adjusting its strategies as conditions surrounding the issue changed. While the switch from fluorocarbon-propelled aerosol spray cans entailed costs to industry, it had not up to this time, cost the general public. The general public now faced monetary costs, but more importantly, it faced sacrifice in terms of comfort and life style as well.

This shrewd tactic employed by the fluorocarbon industry of appealing to consumer's interest was attacked during an interview with Russell Peterson, a former DuPont chemist who had played an important role in the battle against aerosols as chairman of the president's Council on Environmental Quality. Peterson referred to the tactic of industry as a "delaying action," and he maintained that it was being used strictly to continue profits. As the following quote suggests, self

interest of managers was the motivation behind the delaying tactics, according to Russell.

If you put your life into producing this product, if your salary is related to the production of it, you are going to look for all sorts of excuses for not facing up to the critical problem (August, 1986).

Pressure against industry was increasing as more evidence of the massive hole in the ozone layer over Antarctica accumulated. The discovery of the hole in the ozone layer represented valid proof of ozone depletion to most scientists. With this discovery came a renewed interest by industry to develop alternatives for fluorocarbons. As the threat of governmental regulation waned in the early years of the Reagan era, many industries abandoned research into substitutes for fluorocarbons. But as CBS reporter Jayne Quinn stated, "Now it [industry] is scrambling for a new position." The search for fluorocarbon alternatives was seriously being considered by some industries.

Two months later on October 20, 1986, CBS news segment focused on the hole in the ozone layer found over the North Pole. As evidence supporting the ozone depletion theory increased, industry seemed to lack a stalling tactic. Jayne Quinn reported, "In the past, industry strongly opposed any limits on CFCs. Now, as the case against the chemical mounts, they have changed their minds." For the first time, DuPont

officially admitted that the evidence appeared convincing and judiciously conceded the need for the regulation of fluorocarbons. During an October, 20 interview, the vice president of DuPont, Dr. Elwood Blanchard said, "It is not prudent to say we can wait. It's much more prudent to say no, lets control now." Some leaders of industry had called for voluntary limits on the production of fluorocarbons. Other industry spokesmen maintained a hard-line approach to the notion of regulation. Tom Stokes of General Motors, for instance, saw no reason why a company would voluntarily limit its production of fluorocarbons. Limiting production "would be irresponsible from a business standpoint," he maintained. He referred to such action on the part of industry as "fool-hearted," and "crazy."

For some individuals in the fluorocarbon industry there was a renewed desire to develop alternatives to fluorocarbons. The Department of Energy praised the strides taken to develop alternatives. However, during an interview with inventor Tom Edwards, it was pointed out that the auto industry had not welcomed his air conditioner that ran without fluorocarbons. His experience with the auto makers had shown him that his invention had not been tested fairly and that they merely wanted to "show that there was not an alternative" to the fluorocarbon air conditioner.

The focus of statements by industry spokesmen from DuPont and Imperial Chemical Industries (ICI) of Britain was still

centered on consumers and the general public during a May 1, 1989 news segment on ABC. Joseph Glass, of the DuPont company, warned of impending consequences for the public if chemical companies were forced to rapidly phase out the production of fluorocarbons. He pointed out that if the company phased fluorocarbons in five years "virtually every building in downtown Washington is going to be without air conditioning." A more inclusive summary of the consequences for society was offered in the same news segment by Mike Harris of Britain's ICI. He stated:

CFCs, which we as a company have said that we want to see phased out, are used in so many ways in our society that they are a thread woven through the fabric. And our task is to unravel that thread without tearing the fabric.

Reporter, Ned Potter, maintained that it would take pressure from government and consumers if the second phase of the fluorocarbon/ozone problem was to be solved. Using the aerosol spray can phase of the problem as an example, Potter recalled the integral role consumers played in pressuring spray can makers into changes. Consumers had played a pivotal role during the aerosol spray can phase of the issue, and "if consumers demand CFC replacements as they did with aerosols, there will be incentives for industry to provide them." This, Potter maintained, would be part of a potential answer for an issue involving science, business, and government.

Senator Albert Gore, (D) Tennessee, insinuated that the perception of the issue by the general public was important if human resolve was to be effective. He commented on the difficulty people have in fathoming the problem:

It is hard for people to realize that a threat like this is real. Because it is so different from anything in our historical experience, that it sort of sounds like a bad science fiction movie.

Human resolve was being tested, and during this last segment involving industry, spokesmen from the chemical industries, a politician, and a reporter had continued to focus their comments on the critical role of consumers.

Conclusion. Strategies of spokesmen for industry on television news radically changed over the years, adapting to developments with the issue. Statements by industry spokesmen were typically made in reaction to the claims of scientists and regulatory agencies. During the claims-making process, spokesmen appeared judicious, emphasizing concern and social responsibility of their company. Maintaining equilibrium and a confident posture seemed to characterize the tenor of their replies.

A definite change in the response of industry spokesmen occurred after the first suggestion of policy by a task force composed of several government agencies. The recommendation of placing warning labels on spray cans was denounced as

premature. Scientific claims were questioned. The rigor of industry's contention with scientists and the media was much stronger in their trade journals and public meetings than on television news, however.

The full-scale counter attack by industry occurred as sales of their products began to fall. The focus by industry spokesmen turned to the public. The second phase of the plan to reduce CFC production, that dealing with air conditioning and refrigeration, forced industry spokesmen to emphasize the possibility of higher costs of products and sacrifices in life style.

Portrayal of Politicians in Atmospheric Deterioration News Segments

Introduction. There were three basic messages politicians expressed during the three years of their appearance on evening news. In most instances they criticized the administration, particularly the president's lack of effort toward creating meaningful global warming policies. Various politicians also criticized the administration's tendency to only recommend more study of the problem, rather than following through with useful proposals or agreements with international treaties. In a few instances, politicians stressed the severity of the problem, suggesting that immediate action was called for. Evening news also portrayed these individuals as advocates, as politicians attempted to

garner support for international cooperation, and sought to aid third world countries in dealing with the problem of global warming and ozone depletion.

Criticism of the Administration. The first appearance of a politician occurred on May 29, 1987, when Representative Jim Bates, (D) California, castigated Interior Secretary, Donald Hodel, for his suggestion that the way to deal with ozone depletion was for people to stay out of the sun, wear hats, sun lotion, and sun glasses. Hodel reaped a whirlwind of ridicule for the suggestion. Representative Bates was shown in his office putting on a pair of sunglasses saying, "I guess this is the way we would all be going around, with our eyes dark at all times." In addition to the statement by Representative Bates, disparaging remarks were made by environmentalists regarding Hodel's suggestion, in particular, and the administration's lack of response to the issue of global warming, in general. Criticism by politicians of the administration continued during the next year. This time the focus was on President Reagan, his efforts to reduce controls on industry, and his constant attempts to sabotage policies against pollution. During an ABC news segment on September 7, 1988, ground ozone pollution was the topic, and one culprit, it was suggested, was Reagan. The reporter posed a rhetorical question, asking what had happened to the advances made twenty years ago against auto emissions and other forms of pollution.

According to many environmentalists, the answer, the reporter stated, was Ronald Reagan.

The reporter stressed that as Reagan came to office, American environmental action against pollution came to a halt. Emission standards were loosened, and research money for energy conservation was cut. A short clip of Representative James Florio, (D) Florida, gave a synopsis of the impact of the Reagan era. Florio stated, "This administration, unfortunately, will go down in history as presiding over what might be considered a lost decade of environmental concerns."

Politicians' critical appraisal of the administration's inability to implement meaningful policy combating the greenhouse effect and ground level ozone continued throughout 1989. Los Angeles was used by television evening news as a prime example of the urgent problem of smog. During a January 17, 1989 segment on ABC, Representative Henry Waxman, (D) California, stated, "We can't just continue to say we are going to keep studying these problems. We have to act." And some of the proposed actions were radical.

The radical policy proposals suggested by Los Angeles politicians served as a precursor of changes other cities might be forced to consider. Some of the Los Angeles changes were to take place in the spring of 1989, while the rest were to be implemented in stages within nineteen years. One regional agency's plan to bring air pollution under control

included an assortment of drastic measures. People would not be allowed to drive to work alone, but instead, would car pool. Cleaner fuels or electricity would be used as alternatives for gasoline. Even home life would be effected. Gas powered lawn mowers or barbecues would not be allowed. Dr. James Lent, an Air Quality Manager, stated the life style of Californian's would have to change in order to accommodate sixteen million people in the California basin over the next twenty years.

The greatest amount of criticism expressed by politicians during television evening news during 1987-1989 concerned the Bush administration's attempt to change the written testimony of NASA researcher, Dr. James Hansen, a leading expert on the greenhouse effect. All three networks covered the tampering by the Office of Management and Budget (OMB) of Hansen's conclusions. ABC's Ted Koppel opened the May 8, 1989 news segment by saying, "The man who promised to be the environmental president is under fire today by some environmentalists." It was Albert Gore, (D) Tennessee, greenhouse effect committee sub-chairman, who led the onslaught of criticism.

After a clip of James Hansen stating the gravity of the problem, ABC reporter, Barry Sariphin, pointed out that Hansen's written testimony, as it appeared in the official release, had a far less urgent tone than the NASA report he had submitted. A paragraph in the "official" version of his

report indicated that climate changes should be seen as estimates, not as reliable prediction. During testimony at the subcommittee hearing, Hansen stated that he objected to the addition of a paragraph, because in essence, it implied that all of the scientific conclusions of the study were not reliable. Senator Gore stated:

If they force you to change a scientific conclusion, it is a form of scientific fraud by them. The administration does not want to act, they want to sit still and do nothing (5/8/1989).

White House spokesperson, Marlan Fitzwater, said that the testimony had been changed "to reflect the administration's view that there is considerable disagreement about the causes and effect of global warming." Although Fitzwater maintained that Hansen was not in trouble for disagreeing with the administration's view, Senator Gore vowed to protect Hansen.

That evening, on NBC the same incident was reported. Peter Jennings pointed out that the Bush Administration was under much criticism over how the OMB had handled the scientific report on the greenhouse effect. NBC reporter, Robert Hagger, reviewed how the agency had ordered a change in Dr. Hansen's conclusions. These findings actually suggested that global warming may occur sooner than expected, and that droughts could occur more frequently than research had previously suggested.

In the news segment, NBC's coverage was similar to that of ABC's, using some of the same comments of Senator Gore. In addition to Hansen's comments, Dr. Jerry Mullman, another researcher for NASA, was asked by Gore which scientists at OMB had ordered the change in testimony. Mullman answered, "They are all anonymous." Senator Gore also asked Hansen if "these are nameless, faceless individuals with whom you are dealing." Hansen confirmed that the OMB members had remained unidentified.

These two news segments reported on Senator Gore's incrimination of President Bush during the subcommittee hearings. Gore pried for information about the culprits in the Bush Administration's OMB, showed anger in his comments, and directed his critical commentary toward the tactics of the Bush Administration. Immediately after Senator Gore's comments, reporter Robert Hagger pointed to the changed posture regarding global warming by Bush. Bush had become more cautious with the issue. The United States had decided to not join other nations in calling for a world conference on the problem. The administration had once again reverted to the stalling tactic of calling for more study before beginning costly steps to deal with the problem.

Four days later, during a May 12, 1989 news segment on ABC, the incident was reviewed, and Senator Gore was once again on the offensive. Reporter Ned Potter said President Bush had been embarrassed by news reports of the OMB changes

in Hansen's testimony. Peter Jennings said the president had announced a new concern for the issue, suggesting the U.S. should take the lead for the rest of the world in finding a solution. But Senator Gore had declared that leadership had been missing from the president on the issue. Summarizing the past occurrences, Senator Gore asserted, "Once again President Bush has been dragged slowly, kicking and screaming towards the correct position."

That same evening, CBS recounted OMB's efforts to soften Hansen's testimony, but accented the proclaimed change in the Bush Administration's stance regarding the issue. Anchorperson, Connie Chung, referred to the change as a "major about-face" by President Bush. She pointed out that the president now endorsed an international treaty to deal with the greenhouse effect and had offered to "host an international conference on the effect of the gradual warming of the earth."

Harsh criticism of the Bush Administration's lack of effort in dealing with the greenhouse effect continued throughout 1989. On November 7, 1989, NBC reported on the role of the U.S. in defeating an international proposal to cut emissions of carbon dioxide, a move that would slow the greenhouse effect. It was pointed out that sixty three nations, including all Western European countries, favored setting the year two thousand as a target date for reducing the pollution. Only six countries opposed, led by the United

States. The change in positions by George Bush was demonstrated by contrasting a statement by Bush the candidate, with a statement by Bush the President. Reporter Robert Hagger accented the dissimilarity when he instructed the television audience to listen to George Bush as a candidate: "I have pledged that in my first year of office I will convene a global conference on the environment at the White House to address global warming." Hagger pointed out that the conference has been postponed and referenced the audience to President Bush's statement against quick action on global warming. President Bush was shown at a news conference stating, "You can't take a policy and drive it to the extreme and say to every country around the world, 'you aren't going to grow at all.'"

The final 1989 news segment covering the greenhouse effect, included clips of politicians accenting the magnitude of the challenge and criticizing the Bush Administration's lack of action in dealing with the problem. Senator Gore stated, "The problem is so severe we have to act." Senator Tim Wirth (D), Colorado, referred to the problem of global warming as, "the most grave concern we have ever faced."

The ABC reporter pointed out that Bush had promised solutions to the problem during his campaign. A clip of Bush during the campaign showed him stating, "Those who think we are powerless to do anything about this greenhouse effect are forgetting about the White House effect." Referring to the

president's critics, the reporter commented that the administration had used numerous delaying tactics. The administration had called for, then canceled a global warming conference. It had changed the written testimony of NASA's Dr. Hansen. In Holland, it delayed an international agreement on reducing carbon dioxide. Senator Wirth maintained that the United States should be an international leader on the issue of global warming. However, he stated, "Unfortunately, rather than being a leader, what we have done is abdicate our leadership role."

Politicians as Advocates. Another message that was expressed by politicians appearing on evening news coverage of global warming and ozone depletion was the need to support international treaties and cooperation. Part of this international cooperation involved appeals to third world countries. A March 5, 1989 CBS news segment covered the world ozone conference in London. Britain's Margaret Thatcher was shown meeting some of the representatives of one hundred and twenty nations that had been invited to the conference. CBS reporter Tom Finton pointed out that Thatcher's aim was to persuade the world's developing nations to cooperate with industrialized nations in phasing out chlorofluorocarbon production. A short film clip of Albert Gore explained the importance of third world countries' involvement:

Just because we made a mistake does not mean that they need to repeat the same mistake. We should help them leapfrog the age of chlorofluorocarbons and to get the technology they need to use the substitute.

The following evening, on March 6, 1989, ABC covered the conference and included a clip of Britain's Prince Charles speaking before the conference. He stressed the importance of appealing to "the man in the street." A video using animation and the voice of Margaret Thatcher was shown to warn the audience of the dangers of polluting the atmosphere. The presence of Margaret Thatcher and Prince Charles at the world conference was portrayed as symbolic, showing their support for the possibility of banning CFCs.

Conclusion. Politicians were one of the last actors to appear during the national television evening news career of these two related environmental issues. Politicians did not emerge until 1987. This was a full eleven years after the initial segment dealing with ozone depletion, and four years after the greenhouse effect issue first surfaced on evening news.

Research and policy formation concerning fluorocarbon production and use had originally been the responsibility of the FDA, CPSC, and EPA. These agencies had been responsible for directing research, appointing scientists to conduct studies, and drafting reports. However, the esoteric issue of

atmospheric pollution had, over the years, gained public recognition, and had become an international issue. The president and his administration were viewed as more directly responsible for advocacy regarding proposals, treaties, and policy implementation.

There is an additional explanation as to why journalists had avoided associating politics with atmospheric pollution. Journalists who specialize in science reporting normally avoid the appearance of expressing a political view. In order to maintain the appearance of journalistic neutrality, they tend to view their primary role as explaining science instead of interpreting its political implications. A heavy reliance on scientific sources of information in reporting on atmospheric pollution may have created a narrow interpretation of the issues. A broader perspective had slowly developed over the years of reporting, one including economic and political explanations rather than positing responsibility of the problem on aberrant individuals or companies.

Environmentalists in Atmospheric Deterioration News Segments

Introduction. Statements by environmentalists were used by evening news predominately to highlight the ramifications of policy by government agencies and international conferences. Their comments often pointed to inadequacies, and their assessments emphasized the laxity of proposals in the face of what they considered to be grave environmental

dilemmas. Environmentalists often interpreted the meaning of policy recommendations, usually by insinuating the implications. They denounced policy recommendations of a task force, the EPA, and the Reagan and Bush administration. Their statements were portrayed as oppositional in that their opinions were commonly pitted against advocates for a proposed policy.

An Early Appearance. Except for one early appearance in 1975, environmentalists were not used by television evening news during segments covering atmospheric deterioration until 1987. A brief clip of an environmentalist was inserted during an ABC news segment on June 12, 1975, in which a federal task force concluded that enough evidence existed to warrant concern that aerosol sprays were damaging the ozone layer. The task force recommended immediate labeling of aerosol spray cans, but did not suggest any other action. ABC reporter Bill Matley, cast the statement by Ruby Compton, of the Natural Resources Defense Council, against that of a DuPont spokesman. The reporter introduced the two opposing actors by saying that the report drew challenges from the aerosol industry and from an environmental group. After the DuPont spokesman charged that the regulation was premature and wrong, Ruby Compton stated, "And we believe the regulatory agency should initiate rule making proceedings immediately." The first statement on evening news by an environmentalist was presented as

unequivocal and in opposition to industry.

Although environmentalists were not used on television evening news for the first twelve years of coverage of the issue, there were several environmental groups that played a significant role in initiating legal actions and criticizing policy. In June, 1975 the Natural Resources Defense Council (NRDC), a legal organization formed in the early 1970s introducing actions relating to environmental protection, petitioned the CPSC to ban fluorocarbon spray cans (Dotto and Schiff, 1978). The CPSC rejected the NRDC's lawsuit, maintaining there was insufficient evidence that CFCs harm the ozone layer.

Alan Miller, an attorney working for the NRDC, referred to the time period after the aerosol ban as the "dark years," a time when little legal action and hardly any media attention occurred. Although other environmental groups dropped ozone depletion from their agenda during this time period, the NRDC continued to press for additional CFC regulations. In 1984, David Doninger took over the CFC issue from Miller and initiated action by the NRDC suing the EPA for failing to provide Phase Two regulations on CFCs as specified by the Clean Air Act (Roan, 1989).

The Late Stage of the Issue. A full twelve years after the first interview of an environmentalist, a second appearance occurred on CBS, May 29, 1987 news segment. Three

environmentalists were shown speaking at a news conference in Washington, D.C., each responding to Interior Secretary Donald Hodel's suggestion that people should deal with increased ultraviolet rays resulting from ozone depletion by wearing hats, sun glasses, and sun screen lotion. Their statements were satirical as each speaker was shown mocking Hodel. Each speaker wore a hat, sun glasses, and sun screen as they made their comments.

CBS reporter Eric Engberg introduced the statements by pointing out that environmental groups were charging Hodel with attempting to "torpedo" a treaty to reduce fluorocarbons. This treaty had won acceptance by thirty one countries. David Donninger of the Natural Resources Defense Council pointed out that the animals, crops, and fish could not wear sun glasses, hats and sun screen. Tina Hobson, of the Fund For Renewable Energy, derisively stated, "When I woke up this morning and read the newspaper, I really believed that Saturday Night Live was going on at the White House." Michael Clark, of the Environmental Policy Institute, used parody in stating, "It was as if James Watt never left the Interior Department." The magnitude of criticism against Hodel's recommendation called for dynamic response and environmentalists seemed the appropriate actors to sardonically express condemnation.

Not all responses by environmentalists were depicted as caustic rebuttals. In September 16, 1987, ABC used a clip of

a spokesman from the Environmental Defense Fund responding to the signing of an ozone protection treaty by 50 countries. The spokesman pointed out that the chlorofluorocarbon industry maintained they could have substitute chemicals ready within five years. In a move toward conciliation, the spokesman stated, "Let us take them at their word. Let's make sure this happens. Let's protect the ozone layer." His statements reflected an undertone, however, of cautious mistrust.

The oppositional role in which television news typically characterized environmentalists reemerged during a December 1, 1987 news segment. David Donninger of the Natural Resources Defense Council took issue with the EPA contention that a 50% reduction in ten years of ozone depleting chemicals would stop the destruction. Environmentalists disagreed, according to the ABC report. Referring to the EPA proposal, Donninger stated, "It won't even stop the build up of these chemicals in the atmosphere; and ozone destruction that is already going on will continue and probably get worse."

On CBS that same night, David Donninger's disagreement with the EPA proposal was again used as an example of criticism lodged against the administration. While environmentalists were shown taking opposition against the lenient proposal, reporter Len Tucker pointed out that industry was backing the government proposal. Donninger appeared stating,

The reductions are not going to go far enough or fast enough to stop ozone depletion. Ozone depletion is going on now, because of the chemicals that are already loaded into the atmosphere.

The interpretation of the proposal, how stringent it was, or its implications were not explicitly summarized by the reporter. Instead, the reporter was able to maintain a sense of neutrality in reporting by establishing which actors were allies and which were in opposition.

ABC news turned to an environmentalist to accent the gravity of the greenhouse effect during the heat wave of 1988. In addition to the use of scientists who supplied information and predictions based on their data, a July 27, 1988 news segment included Michael Oppenheimer of the Environmental Defense Fund. After an animation demonstrating possible changing temperature patterns in the U.S. Oppenheimer stated, "The future of the habitability of the planet is really in doubt." As in other news segments, the environmentalist's statement was presented as extreme and emotionally based.

The use of environmentalists to offer interpretations and critiques of reports and policies continued. In an October 20, 1988 news segment, Peter Jennings gave a synopsis of an EPA report summarizing possible future costs of the greenhouse effect. Environmentalist Jeremy Rifkin assessed the significance of the report by stating, "Up to now the global greenhouse crisis has been a scientific issue. With this report, it becomes a political issue and an economic issue."

Another environmentalist appeared in a May 8, 1989 news segment on CBS, in order to give his interpretation of the controversy created by OMB's attempt to change the scientific report by Dr. Hansen of NASA. After the dispute had been reviewed, Joseph Goffman of the Environmental Defense Fund stated, "Our expectation in the environmental community is that George Bush wants to take this problem seriously. But it looks as if the rest of his administration thinks otherwise."

Environmentalists continued to be used as interpreters of reports and policy recommendations. A July 27, 1989 news segment reviewed an EPA report detailing the worsening condition of ground level ozone for much of the country. David Hawkins of the Natural Resources Defense Council gave an inflammatory summary of the plight of U.S. policies dealing with air pollution in general:

Programs have been slowed, they have been delayed,
they have been weakened, they have been repealed.
We just have not followed through on the promise to
the American people to clean up the air.

Hawkins thus offered a context for the viewer to understand the quandary of U. S. policy attempting to protect the atmosphere.

Conclusion. Environmentalists have only recently been used in news segments covering atmospheric deterioration. It may be that atmospheric deterioration was not a priority on

the agenda of many environmentalists until the late 1980s. During the 1970s many environmentalists were involved with the nuclear power issue.

Newscasts use brief clips of environmentalists, typically showing a reaction or interpretation of proposed policy. As one might expect, environmentalists are depicted as critical of the official agenda, often pointing to the impotence of projected remedies of regulatory agencies.

Ozone Depletion, Greenhouse Effect, and the Average Person

Introduction. How was the "person on the street" portrayed during evening news segments covering ozone depletion and the greenhouse effect? There were two basic themes characterizing statements of the average citizen. During enactment of the ban on aerosol spray cans, a central idea characterizing statements from laymen was confusion over how to adapt to the new policies. The other commonly communicated message by laymen of the late 1980s was the immediate and practical implications of the heat wave and drought and how it was personally experienced and coped with.

As industry realized over the years, the general public's perception of these two related environmental problems was important, could affect decisions by policy makers, and in some instances, even directly effect sales of products. While the complicated governmental bureaucracy studying the problem took years to form policy and recommend social adjustments,

the average citizen reacted relatively quickly, forming definite opinions impulsively.

The Spray Can Issue: Confusion Over Policies. After only a year and a half of news coverage of the ozone depletion problem, most Americans had formed a definite opinion about fluorocarbons. The opinions of a sample of citizens concerning fluorocarbon use in aerosols was reported by an ABC news segment on November 18, 1976. In this first news segment dealing with the public, a study from the Consumer Product Safety Commission was reviewed. A poll of Americans in 37 states had found that nearly two thirds thought fluorocarbons should be taken off the market. Close to one half of those polled stated that they had stopped buying aerosol products containing CFCs. Regulatory plans to ban aerosol products containing fluorocarbons escalated shortly afterward.

Four months after the above news segment, coverage of the Oregon ban of the sale of sprays using fluorocarbons highlighted the public's confusion. As Stephen Fowler, NBC reporter, pointed out during a March 1, 1977 report, few people knew how many and which products actually contained fluorocarbons. Only a few manufacturers had used labels to list products containing the ozone depleting gases. During this early period there were some exemptions such as aerosols containing medical substances, some herbicides and solvents, but few people knew which products these included. This

initial prohibition was complicated and difficult for regulatory agencies to enforce.

To capture the confusion, NBC used footage of an interview with Robert Younger, an owner of a local general store. Part of the emphasis during the segment was on how little the state had done to make conditions of the ban clear for the general public. The storekeeper referred to the lack of help from the state as he stated:

I haven't heard nothing. Except for that one folder there, but that doesn't tell you anything, you know. So, we will just have to play it by ear, I guess.

Concern about violating the law had been reduced as people realized the amount of confusion the ban had provoked. Paraphrasing a druggist, reporter Stephen Fowler stated, "As long as I try to comply---they are not going to haul me off to jail for an errant can of hair spray." While confusion about the specifics of the ban occupied the focus of the news segment, the mood set by the reporter and the interviewee was light, suggesting the ban had created an inconvenience, but not a large scale problem.

A CBS news segment on the same night also focused on the practical consequences for retailers of the newly enacted aerosol ban. Scenes of retailers pulling aerosol cans off store shelves dominated film footage. CBS reporter, Sharon Lovejoy, explained how retailers had reacted to the ban by

cutting the price of aerosol in half before the ban took effect in order to liquidate their inventory. Some of the products were moved to back rooms or returned to the manufacturers. In some cases even aerosols not containing fluorocarbons were removed from the store. Again, puzzlement was portrayed as the main reaction by individuals during the segment. In an interview with Wally Watson, the owner of a small pharmacy, the confusion surrounding the ban was captured as he explained:

Well, I don't think we had enough information because we did not know what were fluorocarbons and what were not. And they [manufacturers] don't know themselves if it's fluorocarbons, because many of them [products] are packaged by other companies. So they don't know if it contains fluorocarbons or not.

Lack of Concern. The use of citizens in ozone depletion and greenhouse effect news segments disappeared from March 1, 1977 to April 15, 1987. During the latter segment the NBC reporter reviewed the interrelationship of causes and consequences of the greenhouse effect and ozone depletion problem. The reporter pointed out that many scientists had warned that as each generation continued to ignore the threat of world-wide climatic change, the conditions would get worse. In order to emphasize the lack of concern by the general public, a man in a barbershop was shown as he stated, "I'm not worried about it. I won't be around for that long." Part of

the problem, the report implied, was that the populace's insensibility had allowed the continued growth of gases to go unchecked.

The Heat Wave of 1988. The heat wave and drought of 1988 was the single most important event that influenced news coverage of the average individual's reaction to atmospheric deterioration. Until this national occurrence, both the greenhouse effect and ozone depletion was an ambiguous problem, understood primarily by scientists, and most importantly, not experientially encountered by individuals. For the first time people witnessed what some experts believed to be a direct consequence of global warming. People could see the effects in terms of dried up vegetation, they could feel the steaming heat, and they witnessed the increased cost of the heat wave in terms of higher electric bills.

The eighties had brought four of the hottest years in the last one hundred years. A CBS report on June 21, 1988, began by pointing out that "seventeen states registered temperatures over one hundred, and at least sixty cities reported record high readings---." CBS turned to farmers in order to illustrate the effects of the heat wave on one of the businesses that were hurt the most. The drought had implications for the financial situation of the farmers, food prices for the population, and graphically demonstrated the devastation created by the change in the weather. Although

their concerns were related to the practical effects of the heat and drought on their crops, and not the greenhouse effect per se, the concrete conditions created by the weather effecting farmers served as an identifiable situation that most other people could empathize with. Roger Rebout, a dairy farmer from Wisconsin emphasized the economic impact of the heat wave on farmers when he stated, "A lot of the dairy farmers are going to go broke and simply liquidate their herd and sell them, because they don't have the money to feed their herds." Film footage of a "hot-line" for farmers desperately looking for hay to feed their cattle was shown.

The plight of vegetable farmers was also reviewed. Robert Henke, of Seneca Foods, predicted that problems created by the heat wave in the midwest would dictate what vegetables would be available for the rest of the country. A weary looking farmer, Tom Sayers, shown standing in his dried up field said, "A farmer never gives up I don't think, but it don't look good." The head of the Senate Agriculture Committee, Senator Patrick Leahy, (D) Vermont, who had just returned from a tour of the Midwest, emphasized how serious the situation was when he stated, "What I saw was not a disaster in the making, what I saw was a disaster now." This abstract, complicated problem involving the atmosphere had come down to earth, affecting most people of the country in an unequivocal and personal manner.

Stories of the plight of farmers returned several months

later to television evening news segments, but in the meantime, urbanites were interviewed about the heat wave. The heat wave of 1988 brought another environmental problem experienced mostly by city dwellers--smog. During a July 9, 1988 news segment, Jennifer McLogan, a reporter for NBC, indicated that parts of the East and Midwest had the worst cases of smog in a decade, adding health risks to people with heart and lung ailments. A construction worker commented on how hot it was for those working outside and suggested that people drink a lot of fluids and get plenty of rest.

One month later a CBS news segment focused on the smog problem, which, according to David Hawkins of the Natural Resources Defense Council, was twice as bad as the federal health standards suggested as safe for ozone levels in many cities. CBS reporter, Susan Spenser, interviewed a bicycle courier standing on the side of a heavily traveled city street and he remarked on his experience of ground level ozone. He commented, "I think it is really unhealthy. I might as well be smoking a pack and a half a day" (CBS, 8/3/88). Indeed, reports from ozone monitoring cities in major cities indicated that 1988 was becoming the worst year in history for ground level ozone.

Ground level ozone problems continued to be the concern of evening news segments, and the consequences of the 1988 heat wave were being experienced by the "person on the street" in personal ways. On August 6, 1988, ABC reported on the high

levels of ground ozone in Northeastern United States, explaining how ground level ozone is created, and questioning doctors about physical symptoms people were encountering. Reporters continued to interview urbanites about their experiences with the noxious gases.

Film footage of a toll booth attendant illustrated how hazy the air was. The attendant described the air by relating its impact on his senses when he said, "It seems like the air is so thick you can actually taste it, cut it; you could chew it."

People jogging in the city also had to contend with the stagnant air. ABC reporter, Beth Nissan, explained that the physically fit were ironically most at risk. As a runner in Central Park described, "In the past couple of weeks I can see what I have been breathing." The heat wave, and the greenhouse effect that may have caused it, had become part of people's daily experiences, changing what had been an obscure environmental problem into a concrete reality for many people.

The effects of the drought lingered into 1989. During opening comments on a CBS segment on January 3, 1989, it was pointed out that some scientists believed both the loss of ozone and the greenhouse effect were linked to the previous summer's devastating drought. Once again, a farmer was shown in his dried up field in Hondo, Texas, explaining the ruinous conditions of his crops.

The continuation of the effects of the 1988 drought demonstrated that the problem with the atmosphere was a long-term process. As CBS reporter, James Hattori explained, the drought of 1988 was now threatening the crop of 1989. Many Texas counties had received less than half of normal rainfall. Mike Moeller, of the Texas Department of Agriculture, explained the cumulative effect of the drought while scenes of scorched fields were shown.

The urban environment was again the scene of the last two news segments of 1989 including interviews with laymen. Once again, the personal experiences of people coping with immediate and practical problems of smog were focused upon. An ABC segment on January 17, 1989, looked at the ground level ozone problem of Los Angeles, California. One Los Angeles resident commented while looking out her home window that, "On a smoggy day I can't even see the hills that surround by home." Another resident was shown gazing out into the thick haze by his home and suggested that, "Life is not worth living if you can't even breath." The concentrated smog was part of their daily existence, something they could see, smell, and had to cope with even while at home during the day.

The focus of this January 17, ABC report was the air, the culprit of the problem was the automobile, and one solution offered by a regional agency involved altering the life style of many people of California. The solution to bring air pollution to a halt required no more driving to work alone;

almost everyone would car pool. Gasoline was to be phased out in favor of cleaner fuels. In addition, as reporter Ned Potter pointed out, "Your home life changes too, no more barbecues or gas powered lawn mowers." This air quality plan was to be implemented in stages over a nineteen year period. It would also, as Dr. James Lent, an Air Quality Manager stated, make it impossible for Californians to "continue living like we are living today." The intimate acquaintance of urbanites with ground level ozone was captured by the last news segment involving citizens, airing on CBS on July 27, 1989. A new EPA report indicated that a record breaking one hundred and one areas in the U.S. had too much ozone in their air. Chicago was one of the new cities to appear on the EPA list and two Chicagoans were interviewed. One person on the streets of Chicago noted the terrible smell in the city. The other interviewee said, "You can look at your face and you think it's just the humidity but there is a grime layer on your face."

Conclusion. There were two distinct occurrences during the career of these environmental issues that prompted national evening network news to focus on the average citizen. The inconvenience and confusion experienced by retailers of aerosol spray cans were the first occurrence that network news highlighted during 1977 and 1978. The implementation of social policy and the confusion it created involved many

ordinary people and thus made their experiences newsworthy.

Secondly, the heat wave during the 1980s converted the greenhouse effect from an ambiguous and distant scientific issue to a concern experienced personally by all people. Record high temperatures throughout the country scorched the fields of farmers forcing many to declare bankruptcy, while it raised the prices of some foods for the ordinary person. Urbanites could see and smell the dense smog that filled their cities. Higher electric bills also affected the self interest of most people. The ordinary person, as represented by small businessmen, farmers and city dwellers, thus became involved in network news of the issues as the issue was transformed into a tangible problem experienced by many people.

Conclusion

Focusing on key claims-makers appearing in atmospheric deterioration news segments reveals much variation in terms of when claims-makers appear and depart over the years during television news. As the issue develops, certain claims-makers become pertinent and thus appear more frequently on television news while others become less relevant. During the early phase of the issue industry spokesmen and scientists dominated coverage of the issue. As policy was established and implemented regulatory agencies appeared more frequently. Scientists became the focus of attention as their research reestablished the validity of their claims. Finally,

politicians and environmentalists were used by news workers to demonstrate criticism of the administration and regulatory agencies.

Some claims-makers lodge claims and attempt to defend their assertions. There are those who pose counter claims, criticize proposed policies, while others interpret statements and actions by regulatory agencies, the presidential administration, or scientists. However, general theme developments over the years associated with each claims-maker can be abstracted. These themes reflect particular ideologies, demonstrate certain interests in the issue, and shape the claims which get made. Scientists have been the most commonly selected claims-maker over the years. This analysis supports the epistemological view that science is interpretation (Aronson, 1985), that facts are socially constructed through interaction among scientists, the scientific community, media sponsorship, and others who accredit findings through their reactions. The portrayal of scientists' claims changed depending on developments of the issue. At first most claims by scientists were guarded. As this issue gained recognition and the climate of regulatory activity became rigorous during the late 1970s, scientists made forceful claims. The issue faded after the ban on aerosol spray cans. The discovery of the ozone hole and the heat wave of 1988 provided justification for an increase in the number and forcefulness of scientific claims. Thus, the

portrayal of claims by scientists was heavily influenced by overall developments in the issue.

The intensity of scientists' claims also depended on whether the scientist was affiliated with an official institution. Scientists affiliated with official institutions such as the NAS tended to be more cautious: policy decisions often depended upon their assessments. The selected independent scientists, however, made unrestricted claims, often predicting future scenarios unfettered by exact proof or accuracy.

Industry was reactive, responding to claims by scientists and rebutting policies of regulatory agencies. Statements made by industry typically came in the form of counter-claims or strategies. For many years industry spokesmen questioned the lack of scientific "proof" while pointing to their own research findings that contradicted the claims of scientists. Industry benefitted from the conservative nature of science and the scientific value of corroboration. As the ban on aerosol spray cans progressively influenced the sales of products, industry spokesmen warned the public of increased productivity costs that would be passed on to the consumer. The most effective strategy was a plea for more time to verify scientific contentions and to develop alternative products.

Politicians did not appear on television news until 1987. As the issue broadened to an international level, the economic and political implications of international agreements

involved the presidential administration more than individual corporations. Of the claims-makers appearing on the news, politicians are the most highly critical. They are shown during hearings criticizing both the administration's lack of effort to create meaningful policies and its lack of follow-through with purposeful proposals.

Likewise, environmentalists did not appear on national evening news until 1987. As the focus of the issue moved from specific products and industries to the international level, environmentalists served the purpose of interpreting the significance of international agreements and protocols. Although environmentalists were critical of a host of actors involved in the issue, their primary role during national news was to explain the implications of scientific findings, of decisions by regulatory agencies, and of policy statements by politicians.

There were two purposes which citizens satisfied on atmospheric news segments. First, their statements demonstrated the confusion over the implementation of the ban on aerosol spray cans. Average citizens did not reappear until 1988 as they expressed their experience, during the heat wave. Short film clips of people on the street made concrete the ambiguous environmental problem which had future implications.

CHAPTER 6

CONCLUSION

This final chapter first presents a summary of the findings. A synopsis is given of the overall process of the two related environmental issues (how the issues were progressively defined and socially constructed during the 15 year time period), along with a brief review of the individual claims-makers as presented by national television evening news. Also, some weaknesses of the study are presented. Finally, the implications of the study and suggestions for further research are discussed.

Our sense of social problems is inevitably subjective. The designation of social problems occurs as various claims-makers define and interpret their essential character through social interaction. Public perception of emerging social problems which do not have a social history and have not been defined and interpreted depends on this collective definition.

More than most environmental problems, ozone depletion/greenhouse effect are ambiguous problems. There are no immediate consequences, there are no visual aspects to the problems, and yet their "presence" has serious implications for the future more than for the present. For environmental problems such as these, meaning is attributed not by precise

counts of damage, nor by statistics that verify the extent of harm. Instead, the meaning of this global problem arises through accounts of claims-makers and how these accounts are portrayed by media. The social constructionist perspective offers explanation for such ambiguous problems.

The constructionist approach of this study has focused on the process of the issue as reflected by television evening news and the individual claims-makers who have appeared in these news segments over the years. The resulting analysis reveals both support for and variation from the four stage natural history model of social problems formulated by Spector and Kitsuse. Themes developed by claims-makers over the years are also influenced by changes in the issue.

There has been a special emphasis in this analysis of the emergent stage of the social problem. Although Spector and Kitsuse do not mention possible relevance of conditions existing prior to and during the emergence of the problem, this study gives evidence that these conditions may shape how the issue is framed or initially treated, and how the issue will develop over time.

Spector and Kitsuse's emphasis on the second stage regarding the involvement of agencies and other official institutions responding to claims is substantiated by this analysis. Official agencies became involved during the early phase of the issue. They designated task forces to research the problem, interpreted results, imposed restrictions and

demanded changes in products. Later the EPA became involved on the international level, dealing with other countries attempting to impose restrictions on the manufacture and consumption of various products. Official institutions have been involved from the early phase of the issue and continue to play a central role in defining the issue.

This study supports the existence of a third stage identified by Spector and Kitsuse regarding a response by claims-makers to the actions, or lack of action, by official institutions. However, criticism of official action occurred throughout the television career of the issue, not as a distinct stage. In addition, criticism occurred in the form of a thesis/antithesis in which claims and counter-claims were constantly lodged by opposing parties. During the early phases of the issue, industry opposed scientists and regulatory agencies. In more recent years politicians and environmentalists opposed presidential administrative lack of action. Although the actors have changed, a similar format of claims and counter-claims continues.

There is no evidence of a fourth stage from this research of television evening news which is characterized by the establishment of alternative approaches by claims-makers to official approaches. Consumer movements and activities by environmentalists reacting independently could be evidence of this stage, but this has not been reported by television evening news.

This study also focused on individual claims-makers. Various claims-makers appeared and exited during the television news career of the issue. These appearances reflected developments with the issue. During the early phases of the issue, industry, scientists and federal regulatory agencies dominated the interests of television news. Attention remained on specific products and substances. A limited number of certain industries were identified as culprits. Solutions offered focused on consumer habits of consumption.

As the issue moved to the international level politicians and environmentalists took issue with both the Reagan and Bush administration. Most recently representatives of various countries have struggled over proper policies and time-tables of implementation.

Each claims-maker had certain interests. These particular interests influenced the themes expressed by each claims-maker over time. Scientists wished to gain recognition, desired grants for further study, were concerned with establishing proof, in order to predict with a degree of accuracy, and therefore establish certainty of their claims. Industrial spokesmen were concerned with protecting their image and profits while maintaining favorable public relations. Politicians gained notoriety, possibly helping their political careers by creating an image of concern for the environment. Some of these considerations influenced

themes developed by claims-makers appearing in the news.

Limitations of the Study. There were several limitations of the project. This study focused on the content of news, specifically, the process of the issue and how key claims-makers were depicted. The research would be more inclusive if it included analysis of the production processes that select and shape news. A follow-up on the effects of the news on the listening audience would also create a more complete research project. These aspects of the study of television network news were prohibited because of time and money restraints.

The study would have been improved by greater use of statistical measurement and counts of phrases, words and other specifics of the content of news. This approach would provide more precision to the developments of the issue over the years and add strength to the analysis.

Also this is a case study of the development of an environmental issue as portrayed by national television evening news. The great influence of newswriters in selecting and shaping the "image" of an issue has been well documented.

Implications of the Study. This study has implications for the study of environmental sociology. This area of study in sociology lacks a coherent theory. Application of recent developments in constructionist theory in the area of social problems to the study of environmental problems may provide

some congruity to the area of environmental sociology. The constructionist approach to the analysis of environmental issues might address the following questions. How does an environmental problem gain public recognition and social meaning? Who are the key claim-makers involved in an environmental problem and at what stages of the issue do they emerge, become active, and disappear? In what manner do various claims-makers interact and how do they interpret the issue within a social context? What processes characterize the development of the issue?

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APPENDIX

CODING SCHEME FOR VANDERBILT ABSTRACTS

- 1) Date
00/00/00
- 2) Network
ABC
NBC
CBS
- 3) Length of segment in seconds (example: 150)
- 4) Issue:
 1. aerosol spray cans
 2. ozone depletion
 3. greenhouse effect
 4. aerosol spray cans and ozone depletion
 5. ozone depletion and greenhouse effect
- 5) Position of segment in newscast
 1. First
 2. Second
 3. Last
 4. Other
- 6) Number of interviews other than in-studio newscaster.
 - 1.
 - 2.
 - 3.
 - 4.
 - 5.
 6. six or more interviews
- 7) Source of statements
 1. Newscaster
 2. Reporter
 3. Commentary
 4. Interviewee
 5. EPA official
 6. Activist (Affiliation given)
 7. Activist (Affiliation not given)
 8. Researcher (Affiliation given)
 9. Researcher (Affiliation. not given)
 10. Doctor (specialty given)
 11. Doctor (specialty not given)
 12. Scientific report
 13. Congressional hearing
 14. Citizen
 15. Industry spokesperson
 16. International meeting/conference/treaty
 17. Journal

18. Politician
19. Can not tell
20. FDA
21. Manufacturers (general), Industry (general)
22. Task force (general)
23. Conference
24. NAS
25. government (general)
26. Energy Dept.
27. Consumer Product Safety Commission
28. spray can company (general)
29. law students
30. DuPont Spn.
31. Federal Council For Scientific Technology
32. state legislature
33. State Retail Council
34. NASA
35. industry
36. Atmospheric Sciences Council
37. National Oceanic and Atmospheric Administration
38. Jet Propulsion Lab
39. General Motors
40. inventor
41. Natural Resources Defence Council
42. White House spokesperson
43. Environmental Policy Institute
44. Environmental Defense Fund
45. politician outside U.S.
46. scientist(s)
47. National Center for Atmospheric Research
48. government report
49. Climate Institute
50. Climatologist
51. economist(s)
52. Agriculture Dept.
53. UN
54. World Resources Institute
55. naturalist
56. Goddard Institute
57. Woods Hole Research Institute
58. physicist
59. government environmental agency
60. meteorologist
61. county extension agent
62. Asthma and Allergy Foundation
63. Conservation Foundation
64. air quality manager
65. European Economic Community
66. President of U.S.
67. newspaper editor
68. Federation of American Scientists
69. astronaut

70. Institute for the Study of Earth, Ocean and Space
 71. OMB
 72. actors, singers
 73. National Meteorological Center
 74. NOAA
 75. environmental group spokesperson
 76. Space administration
 77. Fund for Renewable Energy
 78. Los Angeles politicians
 79. U.S. Senate
 80. Margaret Thatcher
 81. Union of Concerned Scientists
 82. Pro-nuclear lobbyist
 83. Oregon legislature
 84. Air Conditioning and Refrigeration Institute
- 8) References by newscaster or reporter to above sources
(same list as above)
- 9) Conflict type by source
1. business vs. politics
 2. business vs. government
 3. government vs. government
 4. scientist vs. scientist
 5. scientist vs. government
 6. activist vs. business
 7. activist vs. government
 8. government vs politics
 9. politics vs. politics
 10. law students vs. government
 11. citizen vs. manufactures
 12. scientists vs. business
 13. scientists vs. politics
 14. activists vs. politics
 15. T.V. vs. politics
 16. inventor vs. business
- 10) Consequences
- 0.
 1. skin cancer
 2. genetic change
 3. temperature change
 4. drought
 5. water encroachment
 6. forest fires
 7. uninhabitable
 8. ozone depletion
 9. effects on plants and animals
 10. warming of earth
 11. life style change
 12. lack of crops, food
 13. economic problems

14. cataracts
15. other diseases
16. lung damage
17. injury from spray cans
18. cancer
19. alter earth's climate
20. harm crops
21. harm marine life
22. immune system harm
23. increased diseases
24. eye damage
25. cancer in livestock
26. ecological change
27. melting of polar ice caps
28. harm health
29. harm food chain
30. eye damage
31. genetic mutation
32. greater storms

11) Causes

- 0.
1. chlorofluorocarbons
2. spray can danger
3. increase production
4. other gases (methane etc.)
5. airplanes
6. carbon dioxide
7. energy bombardments from space
8. deforestation
9. automobiles
10. vinyl chloride
11. inhaling spray cans
12. zirconium
13. gases from aerosol spray cans
14. ground level ozone
15. chemicals damaging the ozone
16. pollution
17. sea temperature change
18. methane gas
19. gases from fossil fuels

12) Uncertainty (expressed explicitly about the source type or by the source type)

- 0.
1. scientist
2. government
3. citizen
4. industry
5. T.V. mistake
6. diplomats confused

13) Solutions suggested, policy recommendations, coded by the sources making the suggestions

- 0.
1. legislation
2. economic
3. life style change
4. technological
5. ban
6. proposed ban
7. modify spray can
8. plan to ban
9. warning labels
10. more research
11. alternative forms of spray
12. need for planning
13. develop. substitutes for CFCs
14. freeze production of CFCs
15. phase out prod. CFCs
16. reduce fuel usage
17. international cooperation
18. consumer guidelines
19. regulation
20. car pool
21. cleaner fuel
22. plant trees
23. cut back on coal, gases
24. use energy more efficiently
25. use nuclear power more
26. use solar power more
27. use hydrogen power more
28. symposium held
29. Hollywood-stars used for notoriety
30. proposed restrictions
31. avoid the sun
32. study greenhouse effect of other planets
33. use controls

14) Retractions, reassessments, change in policies

- 0.
1. Retraction
2. Reassessment
3. The situation is worse than thought before
4. Problem not CFCs but energy bombardments from space
5. Methane gas may be contributing to ozone depletion more than previously thought.
6. EPA chief switched positions, he now calls for an end to the production of CFCs.
7. 50% of the public has stopped buying spray products
8. Consumer Product Safety Commission called for a ban on aerosol spray products (after refusing to ban them earlier).
9. (no instance was coded 9)

10. The government proposed a ban on aerosol spray cans (they previously believed to little evidence).
 11. NAS retracts earlier warnings about CFCs, these warnings were too strong, "we do not have an eminent danger on our hand."
 12. The DuPont company reversed itself today and will phase out the production of CFCs.
 13. In a reversal of policy the EPA suggests a phase out of the production of CFCs
 14. President Bush has changed since he called for action against the greenhouse effect, since then the white house has canceled a global warming conference, changed the testimony of scientist on global warming, and delayed calls for emission cuts.
 15. Some scientists say the 88 drought was caused by water temperature changes in the Pacific.
 16. Margaret Thatcher has changed her position regarding CFCs. Now, because of public concern, she is for the protection of the ozone.
 17. The president did an about face today on the issue of the greenhouse effect-he indorsed a treaty on the issue. This was in response to "heat" he got from OMB's down-playing Dr. Hansen's report.
 18. There is no scientific data to support the ban on zirconium.
 19. Dr. Solomon says past ozone depletion calculations were underestimated.
- 15) Explicit statements made about the science, research, or evidence related to the issue by source.
- 0.
 1. No scientific support
 2. May be some truth to the theory
 3. It will be difficult to come up with hard data to support the ozone depletion theory.
 4. More time is needed to research the problem.
 5. Conclusive evidence has been found.
 6. Possible dangers have not been conclusively proved.
 7. New evidence has been found.
 8. Not theoretical now, ozone depletion can now be measured.
 9. People are not willing to give up products for a questionable risk.
 10. Computer projections of the problem looks like science fiction.
 11. Past findings were underestimates of how bad ozone depletion is.
 12. Conclusions of scientists regarding the greenhouse effect ordered changed by the OMB.
 13. We can not wait to have a theory substantiated by

- having a major effect on the ozone occur.
14. Decisions are being made that are not based on fact.
 15. There is not enough evidence to ban production of CFCs.
 16. A controversial theory is that hurricanes will become worse as temperatures increase (from greenhouse effect). Some scientists disagree. This model may be incorrect.

VITAE

Paul Lynn Jacobson was born in Alton, Illinois on September 18, 1948. He received his Bachelor of Arts degree in Sociology from Southern Illinois University, Edwardsville, in 1974. He continued his education at Southern Illinois University, Edwardsville, and received a Master of Arts degree in Sociology in 1978. He spent the next several years as a family/adolescent counselor and as an activist for Illinois Public Action Council.

In the fall of 1985 he began doctoral work at the University of Tennessee, Knoxville. He specialized in the areas of urban sociology and environmental sociology. In December of 1991 he was awarded a Doctor of Philosophy degree in Sociology.